BULLETIN OF MISCELLANEOUS INFORMATION No. 2, 1937
ROYAL BOTANIC GARDENS, KEW

VIII—LIAISON OFFICERS AT THE ROYAL BOTANIC GARDENS, KEW. The Commonwealth of Australia.

The history of liaison officers at Kew was given by the President at the meeting of the Third Imperial Botanical Conference on August 30th, 1935.* At that meeting the following resolutions, relating to a liaison officer from Australia, were proposed by Dr. G. P. Darnell-Smith, Delegate of the Commonwealth of Australia; seconded by Professor R. B. Thomson, Toronto, and carried unanimously after the proposals had been fully supported by several overseas botanists:—

(1) This Conference commends to the Government of the Commonwealth of Australia the importance of maintaining close liaison in botanical matters with the Royal Botanic Gardens, Kew, and urges the Government to consider favourably the appointment of one of the younger Australian Systematic Botanists to work at Kew for a period of at least two years in making a critical examination of the historic Australian type-specimens at Kew and the British Museum, and determining current collections made in the Commonwealth and sent over to Kew for critical examination.

(2) It is further suggested that, at the expiry of his term of service, the officer appointed as Assistant for Australia should be replaced by another of the younger Australian Systematic Botanists.

Copies of these resolutions were forwarded on October 1st, 1935, to the High Commissioner for Australia and to Sir David Rivett, Chief Executive Officer of the Commonwealth Council for Scientific and Industrial Research, to which Council the suggestion of the value of an Australian liaison officer at Kew was originally made in the Director's Report to the Executive Committee of the Commonwealth Council for Scientific and Industrial Research after his visit to Australia in 1927–28.

On February 13th, 1936, information received from the Prime Minister's Department, Canberra, was forwarded to Kew from Australia House to the effect that it was being proposed to bring the matter of the appointment of "A liaison Officer between the Royal Botanic Gardens, Kew, and the Commonwealth of Australia" before the Standing Commission on Agriculture at its next meeting; this Commission includes among its members the Permanent Head of each State Department of Agriculture.

* Report of the Third Imperial Botanical Conference, London, August, 1935. Pp. 16–19.

On July 30th, 1936, the Official Secretary, Australia House, transmitted the following information received from Canberra :—

" Members of the Standing Committee expressed their approval of the proposal for the appointment of liaison officers and the following resolution was passed unanimously :—

' The Standing Committee on Agriculture supports the resolution passed by the Imperial Botanical Conference and commends it for the favourable consideration of the States.'

" Since the meeting of the Standing Committee, the attention of the Permanent Head of each of the State Departments of Agriculture has been drawn to the foregoing resolution and information has been sought as to the nature of any action which it is intended to take in order to give effect to the proposal for the appointment of liaison officers. It is understood that the Department of Agriculture in Western Australia is desirous of arranging for the Government Botanist (Mr. C. A. Gardner) to be appointed as liaison officer, and that the matter is receiving the attention of the Director of Agriculture in that State."

A private letter of September 7th, 1936, from Mr. C. A. Gardner, Government Botanist, Department of Agriculture, Perth, Western Australia, which reached Kew on October 8th, conveyed the welcome news that he had been granted permission by the Government of Western Australia to come to Kew as liaison officer for the Commonwealth. This was followed by an official letter (dated 23rd October, 1936), from the Secretary of the Council of Scientific and Industrial Research, stating that the Council had been able to arrange with the Western Australia Department of Agriculture for Mr. C. A. Gardner to be attached to Kew as liaison officer.

A letter from Australia House, dated December 23rd, 1936, conveyed information as to Mr. Gardner's appointment similar to that which had been received from the Department of the Prime Minister. The letter also gave the further valuable information that " it is proposed that Mr. Gardner shall remain at Kew for at least two years and that he shall be replaced by another officer at the end of his service."

It is very gratifying that the proposal first put forward in a Report to the Executive Committee of the Commonwealth Council for Scientific and Industrial Research has now been adopted and that the Government of the Commonwealth of Australia has followed the examples of the Government of India and the Government of the Union of South Africa in appointing a liaison officer to work in the Kew Herbarium.

Similar resolutions to those recorded above were passed with regard to the Dominion of Canada and the Dominion of New Zealand, and have been sympathetically received by the respective Governments. It seems possible that a liaison officer for New Zealand may be appointed in the near future.

IX—CONTRIBUTIONS TO THE FLORA OF SIAM.

Additamentum XLII.—Two New Genera of Verbenaceae from Siam.

Garrettia *Fletcher*, gen. nov. [Verbenaceae-Caryopterideae] ; *Caryopteridi* Bunge affinis, sed calyce haud lobato, staminibus vix exsertis, labio postico haud fimbriato differt.

Frutex, foliis oppositis simplicibus vel trifoliolatis serratis. *Cymae* dichotomae et trichotomae, axillares vel in paniculam foliatam terminalem coarctatae. *Calyx* campanulatus, 5-dentatus vel fere integer sub fructu ampliatus. *Corollae* tubus et limbus subaequales ; limbus bilabiatus, labio posteriore bifido, inferiore trifido. *Stamina* 4, duo longiora exserta, duo breviora ; antherae dorso insertae. *Ovarium* primo 2-loculare, mox 4-loculatum loculis uniovulatis ; stigma breviter bifidum. *Fructus* maturus globosus, in valvas 4 pyrenas auferentes dehiscens.

Garrettia siamensis *Fletcher*, sp. nov., adhuc unica.

Frutex circa 1·2 m. altus (ex *Garrett*) ; ramuli quadrangulares, conspicue puberuli, lenticellis paucis, cortice brunneo obtecti. *Folia* simplicia, interdum trifoliolata, ovata, apice attenuata, acuta vel obtusa, basi rotundata nunc subito decurrentia vel leviter cordata, 5–10 cm. longa, 2–5 cm. lata, membranacea, supra brunnea, subtus pallidiora et saepe griseo-brunnea, utrinque adpresso-puberula et aureo-glandulosa, nervis supra subconspicuis, costa subtus prominente, nervis lateralibus 4–6-paribus subtus prominulis parallelis intra marginem arcuatim junctis, margine serrata sparse ciliolata, petiolo 1–10 cm. longo supra canaliculato puberulo suffulta. *Cymae* puberulae, dichotomae et interdum trichotomae, multiflorae vel submultiflorae, 1·5–3 cm. longae, laterales vel in paniculam foliatam terminalem coarctatae ; pedunculi graciles, 1–1·5 cm. longi ; pedicelli 0·5–1 mm. longi ; bracteae minutae. *Calyx* extra sparse puberulus et flavo-glandulosus, c. 1·5 mm. longus, 5-nervatus, 5-dentatus vel fere integer. *Corolla* extra glabra vel sparse puberula ; tubus 1·5–2 mm. longus, ad staminum insertionem sparse pubescens, eglandulosus ; limbus bilabiatus, flavo-glandulosus ; labium posticum 1 mm. longum, bilobatum, labium inferum trilobatum, 2 mm. longum, 2–2·5 mm. latum. *Stamina* 4, supra tubi corollini basin 1·5 mm. adfixa, filamentis duobus 2 mm. longis, ceteris 1·5 mm. longis ; antherae 0·5 mm. longae, minute papillosae. *Ovarium* globosum, glabrum, 0·75 mm. diametro ; stylus 2–2·5 mm. longus. *Fructus* globosus 1·5–2 mm. diametro, flavo-glandulosus.

Doi Chiengdao, north of Ban Tam, c. 420 m., *Garrett* 988.

Fruit characters clearly place this genus in the tribe *Caryopterideae*, which includes the genera *Peronema*, *Hymenopyramis*, *Glossocarya*, *Caryopteris* and a recently described genus from Annam, *Karomia*, all of which are characterized by having a capsule which dehisces by four valves into four, 1-seeded pyrenes. The imparipinnate leaves and two stamens of *Peronema*, the greatly enlarged calyx

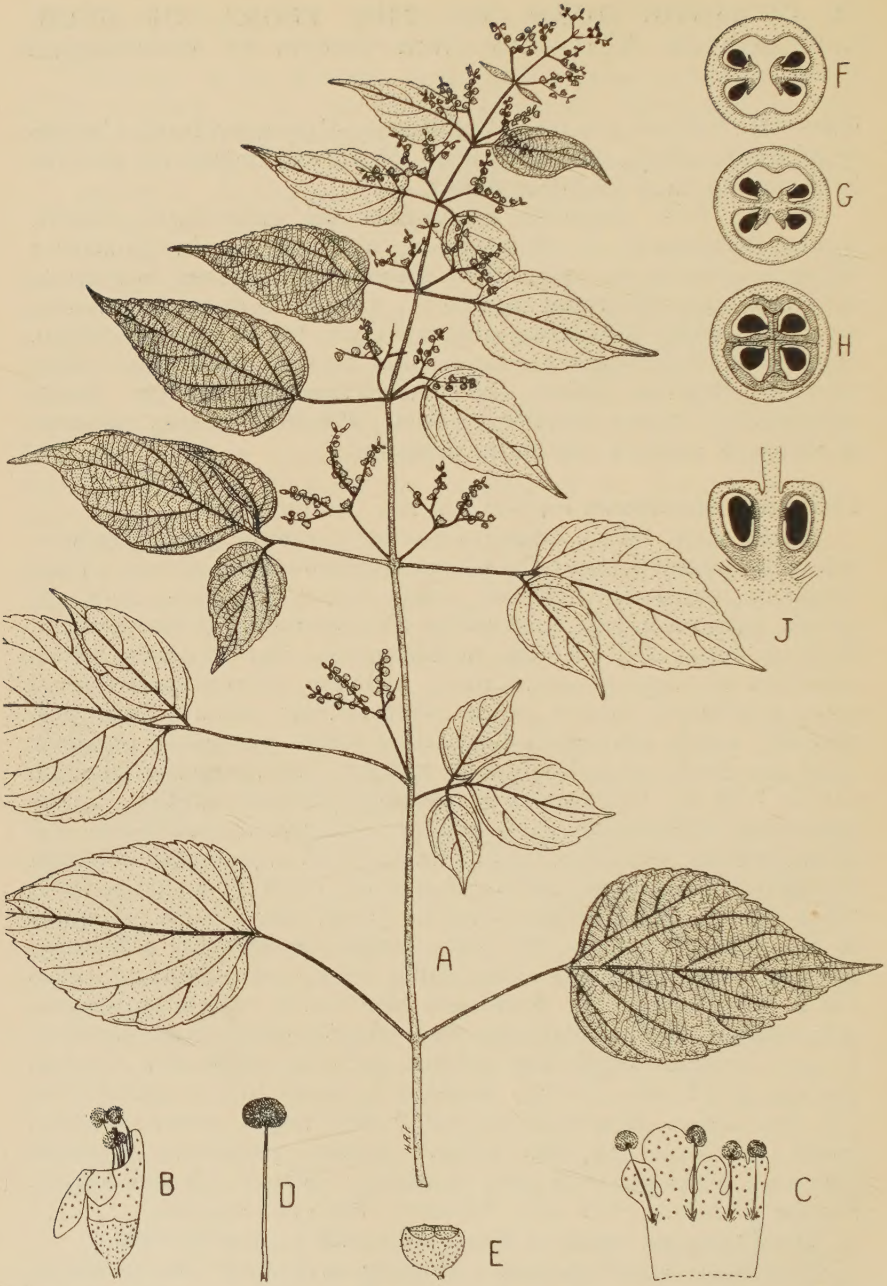

Fig. 1. *Garrettia siamensis* Fletcher. A, twig ($\times \frac{1}{2}$); B, flower ($\times 2\frac{1}{2}$); C, corolla laid open ($\times 2\frac{1}{2}$); D, stamen ($\times 5$); E, calyx enclosing fruit ($\times 2\frac{1}{2}$); F, G, H, diagrammatic transverse sections of the ovary showing stages in its development; J, diagrammatic longitudinal section of the ovary.

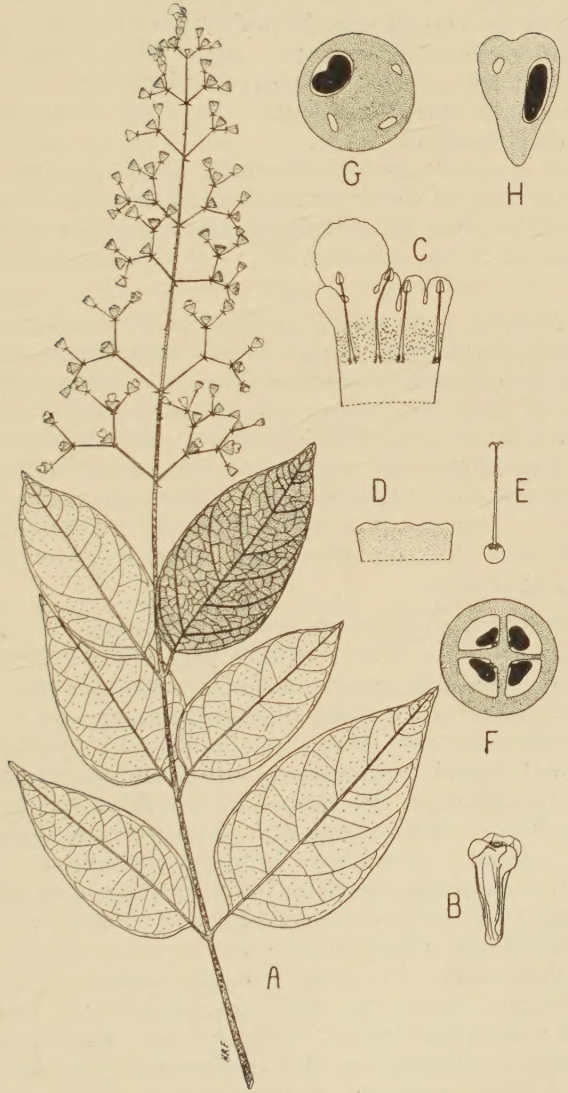

Fig. 2. *Paravitex siamica* Fletcher. A, twig ($\times \frac{1}{2}$); B, fruit ($\times 2$); C, corolla laid open ($\times 2$); D, calyx laid open ($\times 2$); E, style and ovary ($\times 2$); F, diagrammatic transverse section of the ovary; G, diagrammatic transverse section of the fruit; H, diagrammatic longitudinal section of the fruit.

surrounding the fruit of *Karomia*, the greatly accrescent 4-winged utricular calyx of *Hymenopyramis*, and the oblong exserted capsule of *Glossocarya*, clearly forbid its inclusion in any of these genera. Undoubtedly its nearest affinity is with *Caryopteris* which differs in having a deeply 5-fid calyx, greatly exserted stamens, and the posterior lip of the corolla usually fimbriate or toothed.

The leaves are often trifoliolate. Apart from *Peronema* the only other genus of *Verbenaceae* with compound leaves is *Vitex* which has leaves both simple and 3–5-digitate. In *Vitex*, however, the fruit is a 2–4-seeded succulent drupe.

The plant was collected in Northern Siam, on Doi Chiengdao (2185 m.), the second highest mountain within the boundaries of Siam, from which over 30 endemic species are so far known, and is named in honour of the collector, Mr. H. B. G. Garrett of the Forest Service.

Paravitex *Fletcher*, gen. nov. [Verbenaceae-Viticeae]; *Vitici* Linn. affinis sed foliis simplicibus, drupis semper monospermis differt.

Frutex foliis oppositis simplicibus integris. *Cymae* dichotomae et trichotomae, in paniculam terminalem laxam dispositae. *Calyx* campanulatus, truncatus vel sinuato-lobatus. *Corollae* limbus bilabiatus, labio posteriore bifido, inferiore trifido, lobo medio multo longiore. *Stamina* 4, vix exserta; filamenta basi sparse pubescentia; antherae dorso insertae. *Ovarium* 4-loculatum, loculis uniovulatis; stigma bifidum. *Fructus* globosus obovoideus monospermus 4-loculatus, loculis tribus abortivis.

Paravitex siamica *Fletcher*, sp. nov., adhuc unica.

Frutex scandens (ex *Kerr*); ramuli primo quadrangulares mox teretes, glabri, glandulis paucis sucineis lenticellisque numerosis muniti. *Folia* simplicia, ovata vel elliptica, apice acuta vel obtusa vel obtuso-apiculata, basi leviter attenuata vel saepius rotundata, 3–8 cm. longa, 2–4 cm. lata, chartacea, supra brunnea subtus brunneo-grisea, utrinque glabra nervis parce pubescentibus exceptis, subtus glandulis sessilibus sucineis praedita, costa supra conspicua subtus prominente, nervis lateralibus 7–9-paribus subtus prominulis parallelis intra marginem arcuatim junctis, margine integra, petiolo 0·5–1 cm. longo parce pubescente glanduloso suffulta. *Inflorescentia* terminalis, 10–22 cm. longa, basi 6–10 cm. lata, sparse spinulosa, pubescens, glandulosa; bracteae 1–3 mm. longae. *Calyx* glaber, 2–5 mm. longus, truncatus, vel sinuato-lobatus, glandulosus. *Corolla* extra glaber, glandulosa; tubus 5·5 mm. longus, intra glaber nisi ad staminum insertionem ibique tenuiter pubescens; limbus bilabiatus; labium posticum 2 mm. longum, bilobatum, labium inferum 5 mm. longum, trilobatum, lobis apice rotundatis. *Stamina* 4; filamenta 5–7 mm. longa, supra basin tubi corollini 2 mm. adfixa; antherae 0·75 mm. longae. *Ovarium* globosum, 1 mm. diametro, glabrum, apice glandulosum; stylus 7·5 mm. longus, bilobatus. *Fructus* obovoideus, 7 mm. longus, glaber, rugosus, ad apicem parce glandulosus.

Krabin, Aran Pratet, under 50 m., evergreen forest by stream, *Kerr* 19329 ; Angtawng, *Put* 2573 ; Bangpa-in, c. 6 m., waste ground, *Marcan* 1004 ; Supan, Dom Bang, c. 20 m., banks of river, *Kerr* 7002 (type).

This genus belongs to that part of the tribe *Viticeae* which is characterized by having irregular flowers and an indehiscent fruit and which includes the genera *Premna, Vitex* and *Gmelina*.

Premna is distinct in having the corolla consistently 4-partite and the anthers opening by a circular pore. *Gmelina* and *Vitex* both have the stamens dehiscing by longitudinal slits ; in *Gmelina*, however, the flowers, with the corolla 4–5-lobed, are much larger than those of *Vitex*, the corolla of which is always 5-partite. Apart from this *Vitex* is clearly distinct in having, with one varietal exception, digitate leaves.

Paravitex, as the name implies, is most closely related to *Vitex*. The two characters which clearly separate it from this genus are the simple leaves and the structure of the fruit. The ovary of *Vitex* is normally 4-celled and 4-ovuled, although the number varies from 2 to 4. Each cell, however, is fertile so that the drupe is 2–4-celled and 2–4-seeded. *Paravitex* differs in that, although the ovary is 4-celled and 4-ovuled, only one of the cells develops. Thus the drupe contains one fertile cell with one seed and three seedless rudimentary cells.

X—CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA : XXIX.* The genus Periptera. A. A. Bullock.

The history of the Malvaceous genus *Periptera* DC. up to the year 1890, was given in detail by Rose (in Contr. U.S. Nat. Herb. **5,** 173 : 1899), when he described a second species, *P. macrostelis* Rose. Hochreutiner (in Ann. Cons. et Jard. Bot. Genève, **20,** 30 et seq. : 1916), in his monograph of *Anoda* Cav., overlooked Rose's paper, and returned to K. Schumann's opinion (in Mart. Fl. Bras. **12, 3,** 357 : 1894) that *Periptera* should be treated as a section of *Anoda*, a course which E. G. Baker had previously followed in 1892 (in Journ. Bot. **30,** 74 : 1892). *Periptera*, however, in its erect petals and long-exserted staminal column is more readily distinguishable from *Anoda* than is the latter genus from *Sida* L. In his treatment of *Anoda*, A. Gray (in Proc. Amer. Acad. **22,** 297 : 1897), made no mention of *Periptera*, and he regarded *Anoda incarnata* H.B.K. (=*P. punicea*) as a doubtful species, perhaps of another genus.

Hochreutiner recognised only one species of *Periptera* (under *Anoda*), but he described a variety which is here raised to specific rank. A further hitherto undescribed species is added, which brings the total to four species, and provides an interesting geographical distribution for the genus as follows :—

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* Continued from K.B. 1936, 392.

1. *P. punicea* (Lag.) DC. ... State of Jalisco
2. *P. macrantha* Bullock ... States of Mexico, Guerrero and Michoacan
3. *P. macrostelis* Rose ... State of Jalisco
4. *P. trichostemon* Bullock ... State of Sinaloa

Material of *Periptera*, including the type of *P. macrostelis* Rose, has been kindly sent to Kew on loan from the United States National Herbarium, and also the type material of *Anoda periptera* var. *macrantha* Hochr. from the Delessert Herbarium. These specimens have been cited, in addition to those in the Kew Herbarium.

Clavis Specierum.

Columna staminalis glabra vel pilis brevibus simplicibus leviter pubescens :
  Petala anguste spathulata, circiter 2 mm. lata, interdum paullo latiora :
    Columna staminalis usque ad 1·8 cm. longa, saepe brevior .....1. *P. punicea*
    Columna staminalis 2·5–3·5 cm. longa .....2. *P. macrantha*
  Petala late inaequilateraliter obovata, circiter 8 mm. lata.....3. *P. macrostelis*
Columna staminalis pilis stellatis manifeste pubescens .....4. *P. trichostemon*

1. Periptera punicea (*Lag.*) *DC.* in DC. Prodr. **1,** 459 (1824) ; G. Don, Gen. Syst. **1,** 490 (1831) ; Conzatti, Gen. Veg. Mex. 119 (1903). *P. periptera* (Sims) Rose in Contr. U.S. Nat. Herb. **5,** 173, fig. 29 (1899). *Sida periptera* Sims in Bot. Mag. t. 1644 (1814). *S. rubra* Ten. Cat. Hort. Neap. 96 (1813), nom. nud. *Anoda punicea* Lag. Gen. et Sp. Nov. 21 (1816) ; K. Schum. in Mart. Fl. Bras. **12,** 3, 357 (1891) in obs. ; E. G. Baker in Journ. Bot. **30,** 74 (1892), et Syn. Gen. Sp. Malv. 47 (1894).* *A. incarnata* H.B.K. Nov. Gen. et Sp. **5,** 266 (1821). *A. rubra* [Ten. ex] Hochr. Malv. Nov. 33, Genève (1902), et in Ann. Cons. et Jard. Bot. Genève, **6,** 42 (1902) ; *A. periptera* (Sims) Hochr. in Ann. Cons. et Jard. Bot. Genève, **20,** 41 (1916).

State of Jalisco. Rio Blanco, June–Oct. 1886, *Palmer* 604 ; cañons in the mountains near Lake Chapala, Nov. 1892, *Pringle* 4356 ; Sierra Madre, west of Bolaños, 1500–2280 m., Sept. 1897, *Rose* 2945 (U.S.) ; on the road between Bolaños and Guadalajara, Sept. 1897, *Rose* 3046 (U.S.) ; near Guadalajara, Sept. 1903, *Rose and Painter* 7457 (U.S.) ; near Chapala, Oct. 1903, *Rose and Painter* 7647 (U.S.) ; Guadalajara, Oct. 1903, [*ex herb.*] *Holway* 5150 (U.S.) ; Sept. 1886, *W. Schumann* 379 (U.S.).

This is the original species, first described by Sims as a very remarkable species of *Sida*, and segregated by De Candolle as a monotypic genus. Compared with the other three species, the

* This is a reprint of the papers which appeared in the Journal of Botany between 1890 and 1894.

staminal column is relatively short. It is apparently confined to Jalisco, and was described from a cultivated specimen.

2. Periptera macrantha (*Hochr.*) *Bullock*, stat. et comb. nov. *Anoda periptera* (Sims) Hochr. var. *macrantha* Hochr. in Ann. Cons. et Jard. Bot. Genève, **20,** 43 (1916).

State of Michoacan. Rincón, Morelia, 1850 m., Sept. 1909, *Arsène* 64 (typus in Herb. Deless*.) ; *ibid.*, 1950 m., Sept. 1910, *Arsène* s.n. ; *ibid.*, 1900 m., June 1909, *Arsène* 2710 (U.S.) ; *ibid.*, 1850 m., Sept. 1909, *Arsène* 2542 (U.S.) ; *ibid.*, 1900 m., Sept. 1910, *Arsène* 5286 (U.S.) ; Cerro Azul, Morelia, 2100 m., Sept. 1911, *Arséne* 6051 (U.S.) ; Cerro San Miguel, Morelia, 2100 m., Sept. 1910, *Arséne* 6933 (U.S.) ; *ibid.*, 2200 m., Nov. 1910, *Arsène* 6798 (U.S.) ; Punguato, Morelia, 2100 m., Nov. 1911, *Arsène* 6051 ; *ibid.*, 1980 m., Aug. 1910, *Arsène* 6706 (U.S.) ; San Maria, 2100 m., Oct. 1911, *Arsène* 3 (Herb. Deless.).

State of Mexico. District of Temascaltepec : San Jose, Feb. 1932, *Hinton* 285 ; Temascaltepec, 1750 m., Nov. 1932, *Hinton* 2400 ; *ibid.*, Feb. 1934, *Hinton* 5587 ; *ibid.*, Nov. 1934, *Hinton* 6808 ; *ibid.*, Jan. 1935, *Hinton* 7216 ; Cumbre de Tejupilco, 2000 m., Nov. 1932, *Hinton* 2701 ; *ibid.*, Feb. 1934, *Hinton* 5581 ; *ibid.*, Nov. 1934, *Hinton* 7015 ; Ypericones, Nov. 1934, *Hinton* 6997.

State of Guerrero. Between Ayusinapa and Petatlan, 1500–2100 m., Dec. 1894, *Nelson* 2115 (U.S.).

The very long staminal column and longer petals of this species, in conjunction with its geographical separation from *P. punicea*, constitute, in my opinion, sufficient evidence for raising it from varietal to specific rank.

3. Periptera macrotselis *Rose* in Contr. U.S. Nat. Herb. **5,** 174, t. 19 (1899).

State of Jalisco. Near San Sebastian, 1140–1500 m., March 1897, *Nelson* 4086 (U.S.) ; *ibid.*, 1425 m., in a shaded, damp spot on wooded banks of a stream at the bottom of a cañon, Jan. 1927, *Ynes Mexia* 1393 (U.S.).

This species has been collected only twice, and is not represented in the Kew herbarium. It is at once distinguished from all the other species by its broad petals. The staminal column is long, as in *P. macrantha*, but there is no possibility of confusion arising between the two species.

4. Periptera trichostemon *Bullock*, sp. nov., inter species hactenus cognitas calyce multo majore, columna staminali stellato-pubescente valde distincta.

Frutex vel *suffrutex* ; ramuli floriferi tantum visi. *Ramuli floriferi* stellato-pubescentes, basin versus foliosi, superne floribus

* Hochreutiner did not indicate which of the two specimens (*Arsène* 64, *Arsène* 3) he cited was to be the type ; as this is the better specimen, I have chosen it.—A.A.B.

pedicellatis racemiformiter dispositis praediti. *Folia* plus minusve triangularia, basi hastata, superne gradatim minora, utrinque stellato-pubescentia, apice acuta, basi truncata, marginibus plus minusve serrato-dentatis ; folia basi ramulorum floriferorum circiter 3 cm. longa et 2 cm. lata, haec tantum visa, petiolis dense stellato-pubescentibus sesquilongiora ; stipulae ut videtur deciduae. *Flores* rubri, racemiformiter dispositi, pedicellis 3·5–4 cm. longis ex axillis bractearum ortis, bracteis stipulisque subulatis 2–4 mm. longis. *Calyx* 1·4 cm. altus, 10–nervius, 5–lobatus, extra dense stellato-pubescens, intus basin versus praesertim plus minusve pilis simplicibus pubescens ; lobi triangulares 1·1 cm. longi, basi 5 mm. lati, apice acuti, mucronati. *Petala* " rubra, carnosa," spathulata, 1·4–1·6 cm. longa, apicem versus circiter 3 mm. lata, inferne dense stellato-pubescentia, superne glabra, apice late bidentata. *Columna staminalis* circiter 3·5 cm. longa, manifeste stellato-pubescens, filamentis subulatis 2·5–3 mm. longis glabris numerosis apice aggregatis ; antherae 0·75 mm. longae, minute papillosae. *Ovarium* disciforme, ut videtur circiter 14–carpellatum, 2·5 mm. diametro, stellato-tomentosum. *Stylus* vix 3 cm. longus, basin versus tantum leviter stellato-pubescens, apice in ramulos stigmatosos circiter 14 divisus ; ramuli stigmatosi inaequales, filiformes, apice clavati. *Fructus* non visi.

STATE OF SINALOA. Las Cuevas, 150 m., 1922, *Ortega* 800 (typus in U.S. Nat. Herb., dupl. in Herb. Kew.) ; camino para las Cuevas, Cosala, 150 m., March 1919, *Montes and Salazar* 800 (U.S.).

This is evidently a very rare plant ; a manuscript note on the Montes and Salazar specimen reads, " The only plant found. Petals fleshy, red." Ortega gives the vernacular name *Conitaca*.

SPECIES DUBIAE VEL EXCLUSAE

1. *Sida Malvaviscus* Sessé et Moc. Fl. Mex. Ic. ined., ex DC. in DC. Prodr. **1**, 459 (1824) in syn., et auctt. omn. in syn.

In view of the absence of Sessé and Mociño's type, it seems doubtful whether this can be referred with certainty to *P. punicea* (Lag.) DC., as all authors have done hitherto. *P. punicea* occurs only in Jalisco, where it is not, apparently, common ; here also occurs the rare *P. macrostelis* Rose. *P. macrantha* Bullock, on the other hand, is relatively common in Mexico (State), Michoacan and Guerrero. Sessé and Mociño's plant might be any of these three species, but chance would indicate the last as being the most likely.

2. *Periptera megapotamica* (Spreng.) G. Don, Gen. Syst. **1**, 490 (1831), based on *Sida megapotamica* Spreng. Syst. Tent. Suppl. 19 (1828), is **Abutilon megapotamicum** (*Spreng.*) *St. Hil. et Naud.* in Ann. Sc. Nat. Sér. 2, **18**, 49 (1842), a native of southern Tropical America.

XI—ON THE FLORA OF THE NEARER EAST: XVIII*.

New Species, New Records, and Notes. W. B. Turrill.

Glycyrrhizopsis syriaca *Turrill*, sp. nov.; a *G. flavescenti* Boiss. et Bal. in omnibus partibus minus pubescenti-hirtula, calycibus fere glabris facile distinguitur.

Caules sparsissime pubescentes vel fere glabri, longitudinaliter angulato-sulcati, rubelli, in nodis glandulis stipitatis instructi. *Folia* 5–7-juga, 6–13 cm. longa, rhachide glabra vel sparsissime pubescenti; foliola anguste elongato-elliptica vel anguste oblanceolata, apice subacuta saepe apiculata, basi angustata, 1·3 (inferiora) –2·8 (superiora) cm. longa, 4–7 mm. lata, costa in pagina superiore impressa, in pagina inferiore valde prominente et costa sparse (in foliis junioribus densioribus) pilosa, marginibus pilosis vel pilosulis, supra viridia, infra pallide vel cinereo-viridia, petiolulis 2 mm. longis; stipulae lanceolatae, acuminatae, 1–1·2 cm. longae, 3 mm. latae vel angustiores. *Racemus* 14–15 cm. longus (pedunculo 6–7 cm. incluso), 30–40-florus; pedicelli 1–2 mm. longi; bracteae angustissime lineari-oblanceolatae, apice acutae, inferne angustatae, circiter 1·1 cm. longae et 1 mm. latae, leviter pilosulae margine praecipue, purpurascentes. *Calyx* glaber vel fere glaber, tubo 5–5·5 mm. longo 2–2·5 mm. diametro haud gibboso, dentibus adaxialibus conniventibus triangulari-lanceolatis acutis 1·5–2 mm longis 1 mm. latis, dente abaxiali anguste triangulari-lanceolato acuminato 6 mm. longo 1·5 mm. lato, dentibus lateralibus anguste lanceolatis breviter acuminatis 5 mm. longis 1·5 mm. latis, dentibus omnibus leviter ciliolatis. *Vexilli* lamina rhomboidea, apice rotundata, 1·5 cm. longa, 1 cm. lata, basi in petiolum 3 mm. longum angustata; alae 1·4 cm. longae, liberae, laminis anguste oblique oblongis apice rotundatis 1 cm. longis 3 mm. latis; carina 1·4 cm. longa, laminis oblique spathulatis apice oblique truncatis et breviter apiculatis 8·5 mm. longis. *Filamenta* circiter 1·3 cm. longa. *Gynoecium* glabrum, ovario biovulato breviter cylindrico 4 mm. alto, stylo 1 cm. longo.

Syria: a few miles to the west of Antioch, on a pass, April 1936, *G. P. Baker*.

Glycyrrhiza glabra L., in the broad sense in which the species is accepted in Boissier, Flora Orientalis, **2**, 202 (1872), is a very polymorphic species with a wide distribution throughout the Mediterranean Region and into S.E. Central Europe, Russia, and Central Asia. No inclusion of yellow-flowered plants within the species has, however, been made by any of the authors consulted. Post, Flora of Syria, Palestine, and Sinai ed. 2 (ed. Dinsmore) 371 (1932), retains *G. glabra* L., with vars *typica* Reg. et Herd. and *violacea* Boiss., with blue and violet corollas respectively, and *G. glandulifera* W. et K. as species. *G. echinata* L., a species widely differing from the above and from our plant in inflorescence and flower structure and *G. flavescens* Boiss. are also recorded from Syria in the same work. Bouloumoy, Flore du Liban et de la Syrie,

*Continued from K.B., 1936, 103.

93–4 (1930) records *G. echinata* L., *G. glabra* L., and *Glycyrrhisopsis flavescens* (Boiss.) Boiss. et Bal.

The genus *Glycyrrhizopsis* was established by Boissier and Balansa in Boiss. Diagn. **2**, v, 81 (1856), with the one species *G. flavescens* (Boiss.). This had originally been described by Boissier, in Diagn. **1**, vi, 33 (1845), as *Glycyrrhiza flavescens*, with the type as Aucher No. 994, collected " in Cilicia circa Adana." Boissier and Balansa add the following specimens : " circâ *Mersina* ad pagum *Bouloukli* cl. Balansa floriferam fine Aprilis, fructiferam ineunte Junio, in sylvis ad basin montis *Cassii* in viâ a *Laodiceâ* ad *Suadieh* in Syriâ Boiss. Jun. 1846 fructif." In Boissier's Flora Orientalis, **2**, 204 (1872) the same specimens are quoted, with the addition of " in sylvis Amani supra Beilan alt. 4,000′ (Ky. exs. 41 !)."

In the Kew Herbarium specimens are present of *Aucher-Eloy* 994 and of *Balansa* 495 (in flower and fruit). In addition there is a flowering sheet written up " 1521 Glycyrrhiza lutea (Nob.) in Ciliciâ (Asiâ Minor) primovere 1834 Montbret," and certainly the same as *Aucher-Eloy* 994. Lastly, a fruiting sheet, with a printed label, must be mentioned : " Theodor Kotschy. Pl. Syreae bor. ex Amano prope Beilan 1862. 51. **Glycyrrhizopsis flavescens** Boiss. In sylvis montanis Amani versus Apisch Gaja alt. 4000′ 20. Junii."

Boissier and Balansa evidently felt some doubt as to the conspecificity of the Asia Minor and Syrian plants for they note (l.c., 1856) : " Planta Syriaca (cujus flores non vidi) habet legumina paululùm compressiora, semina paululùm compressiora, semina paululùm minora, obscuriora, obsoletius punctata." A comparison of the fruiting material of *Kotschy* 51 (Syria) with that of *Balansa* 495 (Cilicia) in Herb. Kew. shows that there are differences, the Syrian plant having narrower less long tapering legume valves and much smaller seeds. Unfortunately the available material is insufficient to settle the exact distribution of *G. flavescens*, but it is possible it does not occur in Syria and that all the Syrian material formerly placed under this species is *G. syriaca*. The differential diagnosis given above is based on comparison with *Aucher-Eloy* 994 and the description on G. P. Baker's flowering specimen.

One matter remains for discussion—the status of the genus *Glycrrhizopsis*. This was originally separated from *Glycyrrhiza* on the following characters : yellow petals, calyx not gibbous at the base, the wings very obtuse (not " acutate ") straight (not curved) free (not adnate to the keel), ovary 2–ovulate (not 4– or 5–), legume much larger subcompressed (not flat torulose) and dehiscent (not subindehiscent). The calyx character given is probably not of very high value, but the other characters may be considered of generic value, as genera are usually recognized in this family.

Lythrum hispidulum(*Dur.*) *Koehne* in Sitzber. Bot. Ver. Brandenburg, **22**, 22 (1880). *Peplis hispidula* Dur. in Duchartre, Rev. Bot. **2**, 431 (1846-47).

W. Thrace : near Himitli, 60 m., 1.6.36, low damp places in grassland (now drying up), *H. G. Tedd* 1743.

This species was described from Algeria, " les flaques de la plaine d'Oran où il fleurit en avril et mai, après l'entière évaporation de l'eau." It has also been recorded from S. France : Hérault : Montpellier : mares de Roquehaute près d'Agde [Rouy et Fouc. Flor. Fr. **7**, 166 : 1901, as *Lythrum Loiseleurii* Rouy et Cam. subsp. *hispidulum* (Dur.) Rouy et Cam. and from Morocco : occiden. septent. ; Grand Atlas (Jahandiez et Maire, Catal. Pl. Maroc. **2**, 513 : 1932) as *Lythrum nummularifolium* Lois. var *hispidulum* (Dur.) Maire. Rouy and Camus also give under " Aire géogre." Portugal, Spain, and Egypt, but without references to specimens or exact localities. Koehne (in Engler Pflanzenr. IV. 216, 64 : 1903) records " Provinz Algarve in Portugal," as well as Algeria and Montpellier for the species [as *Lythrum hispidulum* (Dur.) Koehne] and says " schwerlich in Ägypten."

L. hispidulum with *L. biflorum* (Salzm.) J. Gay form the section *Middendorfia* of the genus *Lythrum*. This section forms a link between *Lythrum* and *Peplis* and both species have been placed by different authors in *Lythrum* or in *Peplis*. *Middendorfia* Trautv. and *Lythropsis* Welw. are generic names which have been used with specific epithets for one or other of the two known species of the section. The synonymy is given in the references quoted above.

Tedd's material (No. 1743) is ample and agrees so well with Durieu's original description and with Algerian material at Kew that there is no doubt of its correct identification. Further *Lythrum hispidulum* (Dur.) Koehne seems to be quite a distinct species and not merely a variation of *L. biflorum* as some authors have considered it. The campanulate-tubulose " calyx-tube," the minute " appendices," and the rounded leaf bases, as well as other characters are definite and constantly associated in the material examined. Neither the plant nor its flowers are conspicuous and it has probably been overlooked in many localities. At present its known distribution is discontinuous but it may well occur in various intermediate stations.

The essential synonymy of *Lythrum biflorum* (Salzm.) is : *Peplis biflora* Salzm. ex DC. Prodr. **3**, 77 (1828) et Schultes Systema, **7**, 54 (1829). *Lythrum nummulariaefolium* Loisel. in Desv. Journ. de bot. **2**, 330 (1809) non Pers. (1807). *Peplis erecta* Req. in Benth. Cat. Pyr. 111 (1826) nomen nudum. *Lythrum biflorum* J. Gay in Ann. Sci. Nat. **26**, 227 (1832).

Vinca difformis *Pourr.* in Mém. Acad. Toul. **3**, 333 (1788).

Collected in Syria, west of Antioch, by *G. P. Baker*, April 1936.

This species is not recorded in Post, Flora of Syria, Palestine, and Sinai **2**, 186–7 (ed. 2, by J. E. Dinsmore, 1933) or in Bouloumoy, Flore du Liban et de la Syrie, 225 (1930). It has mainly a Western Mediterranean Basin distribution being recorded from : Portugal, Spain, Balearics, S. France, Corsica, Sardinia, Italy, Algeria, and

Morocco. References and a description are given in Rouy, Flore de France **10**, 226 (1908).

Salvia Teddii *Turrill*, sp. nov. a *S. Bertolonii* Vis. caulibus superne vix viscidis, verticillastris dense aggregatis recedit.

Herba perennis, ad 4 dm. usque alta. *Caules* erecti vel leviter nutantes, haud ramosi (inflorescentia excepta) pro parte majore haud foliosi, basi dense longeque hirsuti, in parte media et superiore pilis brevibus patulis vel leviter recurvis eglandulosis praediti, glandulis sessilibus vel breviter stipitatis perpaucis intersparsis. *Folia* omnia basilaria vel duo usque ad 4 cm. supra basem posita, lamina ovata oblongo-ovata vel oblonga usque ad 10·5 cm. longa et 6·8 cm. lata apice acuta vel obtusa basi plus minusve truncata vel cordata margine breviter lobata vel grosse dentata lobis vel dentibus irregulariter crenato-dentatis costa et nervis lateralibus 10–15 conspicuis pagina superiora glabra vel fere glabra minute bullata pagina inferiore dense hispidulis costa et nervis secondariis in parte inferiore hirsutis ; petioli in foliis rosulatis 2–7 cm. longi, valde hirsuti. *Inflorescentia* omnino vel in parte superiore verticillastris dense aggregatis instructa, 7·5–12 cm. longa, inferne leviter et breviter ramosa ramis 1·5–3 cm. longis ; bracteae patulae, late ovatae, longe acuminatae, circiter 1·2 cm. longae et 7 mm. latae, extra albo-pubescentes et glandulosae, intus minute glandulosae. *Calyx* tubuloso-campanulatus, 9 mm. longus, purpurascens, dense glandulosus, labio superiori curvato-adscendente semi-elliptico 5 mm. longo 5 mm. lato apice breviter tridentato dentibus erectis vix divergentibus lateralibus leviter longioribus circiter 0·5 mm. longis fere spinulosis, labio inferiori 6 mm. longo bilobato lobis lanceolatis apice spinulosis 5 mm. longis 2–2·5 mm. latis trinerviis. *Corolla* 1·2–1·5 cm. longa, tubo 6–8 mm. longo superne leviter ampliato, labio superiore parum curvato 6–7 mm. longo disperso-glanduloso dorso piloso, labio inferiore profunde trilobato 6 mm. longo lobis lateralibus multo minoribus. *Stamina* glabra, filamenti apice barbulato excepto, connectivo 6 mm. longo, filamento 3 mm. longo, antheris lobo fertili dehiscente 3 mm. longo, sterili 2·5 mm. longo ; staminodia 1 mm. longa. *Stylus* 2 cm. longus.

W. Thrace : Karpouz Tepé, 930–1300 m., 24·5·36, on rocky slopes of limestone ridge, also in grassy hollows and basin, *H. G. Tedd* 1733.

Flowers dark blue purple.

Salvia Teddii is most noteworthy for the dense inflorescence. The upper whorls are close together and even the lower branches of the whole inflorescence are short and generally not very remote. In general appearance the inflorescence superficially recalls that of *S. nutans* L., but the calyx of this species is quite distinct.

The leaves in the 4 specimens of *S. Teddii* at Kew are grouped at or near the base of the stem, all forming a definite rosette or one pair situated a short distance up the stem. They show a fair range in size as indicated by the following measurements of the lamina

additional to the maximum measurements given in the description above : 5·5×3·5 cm., 7·5×3·5 cm., 8·0×2·5 cm., 9·0×4·5 cm., 10·5×6·0 cm., 10·0×7·0 cm. A pair of leaves situated above the middle of the stem is in shape and texture more or less intermediate between a pair of foliage leaves and a pair of bracts. These leaves may or may not subtend an inflorescence branch.

S. Bertolonii Vis. with which our species is compared was described by Visiani (Flor. Dalm. **2**, 189 : 1847) from material collected " in pascuis locisque herbidis circa Sebenico, Dernis, et probabiliter in reliqua Dalmatia." It is now recorded from Montenego, Hercegovina, Dalmatia, S. Croatia, and Istria. The degree of glandulosity of the upper parts of the stems varies considerably.

Another species which, *e descriptione*, must be morphologically related to *S. Teddii* is *S. similata* Hausskn., in Mitt, Thür. Bot. Ver. N.F. **11**, 36 (1897), with the habitat given as " in schistosis reg. med. Pindi supra Klinovo." The elongated slender stems, the inflorescence with remote whorls, and other small characters appear to be distinctive.

Ornithogalum alatum *Turrill*, sp. nov. a *O. Wiedemanni* Boiss. caulibus altioribus, bracteis haud deflexis, floribus majoribus differt.

Bulbus ovatus, 2–3 cm. altus, 1·5–2·5 cm. diametro. *Caules* 2·0–3·7 dm. alti, glabri. *Folia* 2–3, anguste linearia, apicem basinque versus gradatim angustata, 2·2–3·3 dm. longa vel longiora, usque ad 4 mm. lata, glabra. *Racemus* subcorymbosus, 10–16-florus, 7–13 cm. longus ; pedicelli inferiores usque ad 9 cm. longi, medii et superiores gradatim breviores, erecto-patuli ; bracteae linearilanceolatae, acuminatae, inferiores 3–4·8 cm. longae, superiores 1·5–2·5 cm. longae, plus minusve membranaceae. *Perigonium* 1·3–2·7 cm. longum, tepalis exterioribus oblanceolatis apice minute apiculatis et minute papillosis 6 mm. latis fascia viride 3·5 mm. lata notatis, interioribus oblongo-oblanceolatis apice rotundatis minute papillosis haud minute apiculatis fere 6 mm. latis fascia viride 1·5–2·5 mm. lata plus minusve notatis. *Filamenta* anguste lanceolata, superne attenuata, 7 mm. longa ; antherae dehiscentes angustissime oblongae, 2·5–3 mm. longae. *Ovarium* obovoideum, 7 mm. altum, 5·3 mm. diametro, insigniter alatum. *Stylus* 2 mm. longus.

W. Thrace : Karpouz Tepé, 770 m., 24·5·36, grassy slopes, rocks, and among bushes, *H. G. Tedd* 1741.

O. alatum is a species which appears to be placed best with a small group of plants having more or less well-marked wings to the ovaries and capsules. The species of this small group are described by Boissier, in Flor. Or. **5**, 220 222 (1884), and amongst them is included as a new species *O. Wiedemanni* (l.c. 221). This species was first found by Wiedemann in northern Anatolia at Safranbol and in mt. Aladagh Szeben. It has since been recorded from E. Thrace Aznavour in Bull. Soc. Bot. France **46**, 149 : 1899 and Davidoff in Balg, Akad, Nauk. **12**, 119 : 1915) and from Bulgaria (Stojanov und Stefanoff in Oesterr. Bot. Zeitschr. **70**, 296 ; 1921 and Jordanoff

in Trud. Balg. Prip. Druz. **11**, p. 2 of separate : 1924). Unfortunately no material of the species has been found at Kew and comparison has had to be made with descriptions only.

As with many of the corymbose or subcorymbose *Ornithogala* the pedicels of *O. alatum* lengthen with age, this being particularly true of the lower ones. There is also an increase in size of the petals after anthesis. The wings on the ovaries are well marked and contain many cells partly filled with a bundle of narrow " needle " crystals (raphides). The oldest ovary (or young fruit) present in the type material is 1·1 cm. long and 8 mm. in diameter with the wings 2·5 mm. wide.

Paspalum distichum *L.* Syst. Nat. ed. 10, **2**, 855 (1759) et Amoen. Acad. **5**, 391 (1759).

Specimens of an interesting grass have been received, from Dr. R. C. Shannon of the Rockfeller Institute, from Greek Macedonia. The grass has proved to be *Paspalum distichum* L., a species which, so far as is known, is new to the Balkan Peninsula. In reply to a request for the exact locality Dr. Shannon writes : " I found it growing abundantly in two streams in the Lahanas Hills area in Macedonia, Greece, and less so in other, smaller, streams of the same region. Also I am sure the same species grew abundantly in a borrow pit in the Strymon (Struma) valley, Chimaros Stream, on the east slope of the Hills." In an earlier communication Dr. Shannon explained that the grass was of considerable importance from the standpoint of anopheline mosquito breeding, as a certain species definitely prefers to oviposit in beds of this grass.

Paspalum distichum L. has been frequently confused with *P. vaginatum* Sw. It occurs over a wide area in ditches, streams and wet places in warm and warm-temperate regions in N., Central and S. America, Hawaiian Islands, France, Italy, Transcaucasia, S. Africa, India, China, Formosa, Indo-China, Australia, and New Zealand. A full account of the species is given by Chase in Contrib. U.S. Nat. Herb. **28**, part 1, 46 (1929). Reference should also be made to Stapf in Flor. Trop. Afr. **9**, 572 (1919).

Abies Borisii-regis *Mattf.*

The problems connected with the firs of the Balkan Peninsula are fairly well understood but not solved. Briefly, *A cephalonica* Loud. occurs in Greece proper (*i.e.* south of Epirus and Thessaly), *A. alba* Mill. in the northern and north-central parts, while in a broad belt between, including Thessaly, southern Albania, the extreme south of N. Macedonia, S. Macedonia, Athos, western Thrace, and the Rodope Massif, there occur plants showing various combinations of characters which to the south and to the north are so constantly associated as to be used as reliable specific characters. This very polymorphic population has been named *Abies Borisii-regis* by Mattfeld, who has very carefully and fully described its character combinations in a series of papers of which the longest

is in Bibliotheca Botanica, Heft 100 (1930). The history and origin of this population remains, however, in doubt. Mattfeld accepts a hybrid origin and says " dieser ganze Formenkomplex muss hybridogenen Ursprung haben : *Abies Borisii regis* ist ein populus hybridogenus " (l.c. 81). An alternative hypothesis, that the polymorphic population represents an original population from which *A. alba* has differentiated northwards and *A. cephalonica* southwards is also discussed, but rejected, by Mattfeld (l.c. pp. 82–83). The evidence at present available makes it impossible to decide between these (and other possible) hypotheses.

Dr. E. Anderson suggested to me that an examination of pollen-grains might be of some use in solving the problem. Natural hybrids are less common in the Coniferae than in some groups of Angiosperms and when they have been recorded the percentage of " bad " pollen is generally high.

Four specimens yielding pollen of *Abies Borisii-regis*, to retain the name without commitment to any theory as to the origin or taxonomic values of the plants involved, have been obtained recently. In all of these the pollen was overwhelmingly " good," *i.e.* there were no or at most 2–3 % of shrunken and collapsed grains. The specimens whose pollen was examined under the compound microscope were :

(1) *Tedd*, No. 1720, Thrace : Karpouz Tepé, 930m., 24·5·36, northern slopes of limestone mass. Only one tree here, with one sapling and two seedlings close by. Among beech, *Ostrya carpinifolia*, and *Carpinus*. No cones to be seen on tree or on ground. About 25 ft. high only. Seems to be the survivor of a former forest.

The shoots are hairy, the bud-scales of the opened buds slightly resiniferous, the leaf apices vary from acute or slightly apiculate to obtuse or rounded, they are not or very rarely, and then only slightly, emarginate, leaves 1·1–2·0 cm. long.

(2) *Hill*, *Sandwith*, and *Turrill*, No. 2312, Athos Peninsula : high above Simopetra on the way to Karyes, 700 m., 13.4.34, in open wood dominated by firs.

The shoots are glabrous, the bud-scales strongly resiniferous, the leaves on the flowering branches with apices obtuse or truncate, on the older branches acute, 1·5–2·0 cm. long.

(3) *Stefanoff*, s.n. Bulgaria : Rodope, recd. 8.36.

The shoots are hairy, the bud-scales scarcely resiniferous, and the leaf apices acute to obtuse and sometimes emarginate, leaves 0·8–1·8 cm. long.

(4) *Stefanoff*, s.n., Bulgaria : Rodope, recd. 8.36.

The shoots are hairy, the bud-scales scarcely resiniferous, the leaf apices acute to obtuse and sometimes emarginate, leaves 0·9–2·0 cm. long.

The evidence from the pollen examined is therefore not in favour of an interspecific hybrid nature of the four plants, unless there is also allopolyploidy. That the pollen is almost entirely " good "

does not, of course, mean that there has been no hybridization in the past history of the population of which the 4 plants are a very small random sample. Cytological data would be very welcome and any indications of allopolyploidy should be sought. K. and H. J. Sax (Journ. Arn. Arboretum **14**, 359 : 1933) give 12 as the haploid chromosome number for *Abies cephalonica* and (l.c. 367) note that it has, in their material, 10% pollen sterility. They further (l.c. 369) remark that " polyploidy is rare in the Conifers " and that " the three polyploid species of Conifers described are presumably auto-polyploids."

XII—NOTE ON A SPECIES OF NEORAUTANENIA.

E. P. Phillips.

In the Transvaal many species of plants which grow only a foot or more above the ground have a deep underground root or stem system. As examples may be quoted *Elephantorrhiza elephantina* (Burch.) Skeels, *Pachystigma pygmaeum* (Schltr.) Robyns, *Dichapetalum cymosum* (Hook.) Engl., though a long list of similar plants could be drawn up. The well-developed underground portion of the plant greatly exceeds the aerial portion and enables such plants to send out leaves and flowers even in periods of the severest droughts. They are quite independent of the first spring rains and in parts of the Transvaal, for example, the veld may be green, due to the thousands of plants of *Elephantorrhiza elephantina* in leaf, long before the rains have fallen.

Mr. J. W. Rowland of the Division of Plant Industry, collected a specimen of *Neorautanenia*, probably *N. edulis* C.A.Sm. (Nat. Herb. No. 20385),* at the junction of the Crocodile and Marico Rivers in the western Transvaal, though the plant also occurs plentifully in sandy loam veld of the northern Transvaal.

From the accompanying photograph some idea may be obtained of the enormous size of the underground portion. The length from the point where the main root is broken off to the point where the shoots are given off, is almost one metre. The circumference is 1·62 metres and the total weight of the plant 52 kilogrammes.

* The specimen forwarded by Dr. E. P. Phillips (*Nat. Herb.* 20385) has been compared with the type of *Neorautanenia Lugardi* (N.E. Br.) C. A. Smith, and agrees with it in every respect with the exception of the leaf-shape. The leaves of *N. Lugardi* are subrhomboid-obovate, with the two lowest lateral nerves strongly developed, reaching to the widest part of the leaf, whilst in the plant here figured the leaves are obovate-elliptic, and the two lowest lateral nerves are not so strongly developed. It is probable that *N. edulis* C. A. Smith & *N. Lugardi* are conspecific. They are separated in the Flora of the Transvaal on account of the supposed erect habit of the former, a character which is not supported by the collector's notes on the specimen at Kew.—E. Milne-Redhead.

Neoraudanenia edulis, showing large underground portion.

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XIII—CONTRIBUTIONS TO THE FLORA OF SIAM. Additamentum. XLIII.

Carissa laotica *Pitard* var. **ferruginea** *Kerr* var. nov.; a typo foliis subtus sat dense ferrugineo-pubescentibus differt.

Saraburi, Muak Lek, c. 200 m., evergreen forest, *Kerr* 9118.

Except in the point noted the foliage of this plant agrees very closely with that of the type, as do the stout decurved spines. The only collection is in fruit; the fruit being globular, about 2 cm. in diameter, as far as can be judged from the dried and flattened material.

Ervatamia calcicola *Kerr* (Apocynaceae-Plumerieae); *E. hirtae* Hk. f. affinis, foliis pubescentibus pedunculis brevioribus inter alia differt.

Frutex c. 3 m. altus, ramulis hornotinis subquadratis laevibus glabris, mox teretibus valde corrugatis. *Folia* late elliptica vel ovato-elliptica, apice breviter acuteque acuminata, basi late cuneata, interdum parum inaequilateralia, usque ad 12·5 cm. longa, 5·5 cm. lata, membranacea, supra olivacea sparse breviter pubescentia, subtus pallidiora copiose molliter pubescentia, costa supra leviter impressa subtus prominente, nervis lateralibus utrinque 12–18, patulis subparallelis, supra conspicuis subtus prominentibus, rete venularum supra subtusque subconspicuo; petiolus 6–9 mm. longus, minute pubescens, supra concavus, basi ligula 1·5 mm. longa praeditus. *Inflorescentia* terminalis vel axillaris, cymosa late ramosa usque ad 5 cm. longa, 5 cm. lata, pedunculo communi crasso 0·7–1·5 cm. longo, ut pedunculis partialibus pedicellisque sparse pubescente; bracteae minutae cito deciduae; pedicelli 5–8 mm. longi. *Calyx* 5-partitus, extra minute pubescens, intus eglandulosus; tubus c. 0·5 mm. longi; lobi deltoidei, subacuti, 1·5 mm. longi. *Corollae* tubus extra intusque glaber, 10–11 mm. longus, superne parum inflatus; lobi obovati, apice rotundati, 10 mm. longi, 5 mm. lati, extus parte in alabastro detecta minute pubescentes ceterum glabri. *Stamina* 7 mm. supra basin tubi inserta, antheris 2·5 mm. longis, breviter mucronatis, thecis externis basi parum incurvis, filamentis 0·25 mm. longis. *Carpella* 0·5 mm. alta, apice rotundata; stylus 5 mm. longus; stigma cylindraceum papillosum, stylo multo crassius, apice longius biapiculatum. *Folliculi* velutini recurvati, sessiles, apice breviter rostrati, haud carinati, c. 2 cm. longi, seminis 3–5.

Loi, Wang Sapung, c. 300 m., on rocky limestone hill, *Kerr* 8620B (*type*, flowers); Udawn, Nawng Bua, c. 300 m., among limestone rocks, *Kerr* 8620A (fruits).

Ervatamia celastroides *Kerr* (Apocynaceae-Plumerieae); species *E. malaccensi* (Hook. f.) King et Gamble affinis, a qua pedunculo multo breviore, calycis lobis brevioribus inter alia differt.

Frutex 1–1·5 m. altus, omnino glaber, ramulis striatis. *Folia* interdum imparia, elliptica vel lanceolata, apice longe obtuseque

acuminata, basi cuneata, 4·5–12 cm. longa, 1·5–4·3 cm. lata, subcoriacea, sicco fusco-olivacea subtus multo pallidiora, costa supra parum prominula, subtus prominente, nervis lateralibus utrinque 8–12, cum nervulis supra subtusque inconspicuis, petiolo 2–3 mm. longo suffulta. *Cymae* axillares, 8–15-florae, pedunculis subnullis vel usque ad 5 mm. longis suffultae ; bracteae lineares vix 1 mm. longae, cito deciduae ; pedicelli 2–6 mm. longi ; alabastra apice conica. *Calyx* 5-partitus, tubo c. 0·5 mm. alto, lobis triangularibus obtusis vel subacutis, costam secus incrassatis, margine tenuibus haud ciliatis, intus ad basin glandulosis, 2 mm. longis. *Corollae* tubus 11–12 mm. longus, extra intusque glaber, dimidio superiore leviter inflatus ; lobi obovati parum falcati, apice rotundati, 12 mm. longi, 7 mm. lati. *Stamina* 6–7 mm. supra basin tubi inserta ; filamenta glabra 0·5 mm. longa ; antherae 3 mm. longae, breviter mucronatae, thecis externis fere rectis. *Ovarium* c. 1 mm. altum, apice rotundatum ; stylus c. 5·5 mm. longus ; stigma c. 1 mm. longum, longe apiculatum, ut videtur apiculo integro. *Folliculi* oblongi, plus minusve recurvi, 2·5–3·5 cm. longi, 8 mm. diametro, haud stipitati, leviter 3-costati, apice rostrati, rostro spiniformi c. 8 mm. longo ; semina 5–7, subtrigona, c. 8 mm. longa, hilo alte 3-sulcata.

Nakawn Sawan, Me Wong, c. 200 m., in evergreen forest, *Kerr* 6035 (*type*) ; Prachuap, Hui Yang, *Put* 3240.

The description of the fruit and seeds has been drawn up from *Put* 3240.

Ervatamia ceratocarpa *Kerr* (Apocynaceae-Plumerieae) ; species ab *E. celastroide* Kerr foliis atque floribus majoribus distincta.

Frutex c. 1·5 m. altus, omnino glaber. *Folia* anguste elliptica vel elliptico-lanceolata, apice sensim obtuseque acuminata, basi cuneata, 8–17 cm. longa, 1·2–5 cm. lata, chartacea, sicco supra olivacea subtus pallidiora, costa supra impressa subtus prominente, nervis lateralibus utrinque 10–13, subtus prominulis, nervulis inconspicuis ; petiolus 2–6 mm. longus, supra valde sulcatus. *Inflorescentia* saepius axillaris, interdum terminalis, cymosa 2–5-flora, rarius 1-flora ; pedunculus subnullus vel usque ad 12 mm. longus ; bracteae ovatae 1–1·5 mm. longae ; pedicelli 7–11 mm. longi ; alabaster apice obtuse conicus. *Calyx* 5-partitus ; tubus subnullus ; lobi ovati, subacuti, glabri, intus ad basin glandulosi, 2 mm. longi. *Corollae* tubus 13 mm. longus, medio leviter inflatus, extra glaber, intus infra stamina pilis paucis instructus ; lobi leviter falcati, apice rotundati, 15 mm. longi, 5 mm. lati. *Stamina* 6 mm. supra tubi basin inserta ; antherae 2·5 mm. longae, breviter mucronatae, thecis externis fere rectis ; filamenta 0·5 mm. longa. *Carpella* 0·7 mm. alta, apice rotundata ; stylus 4 mm. longus ; stigma cylindraceum papillosum, apice longe apiculatum, apiculo bifido. *Folliculus* ut videtur saepius unicus, usque ad 5 cm. longus, basi haud stipitatus, apice curvo-rostratus, rostro ad 18 mm. longo ; semina 2–5.

Krat, Kao Kuap, c. 100 m., in evergreen forest, *Kerr* 17692 (*type*), *Put* 2948.

The fruit has been described from *Put* 2948.

Parsonsia siamensis *Kerr* (Apocynaceae-Parsonsieae); species *P. Helicandrae* Hook. et Arn. habitu similis, a qua staminum filamentis brevioribus, haud contortis, calycis lobis rotundatis, inter alia distinguenda.

Caules scandentes, graciles, teretes, minute pubescentes, leviter striati. *Folia* oblongo-ovata vel oblongo-elliptica, apice breviter acuteque acuminata, basi cuneata vel rotundata, margine integra, 8–12·5 cm. longa, 2·5–5 cm. lata, chartacea, sicco supra olivacea, infra pallidiora, subtus ad costam sparse minuteque setulosa, ceterum glabra, nervis lateralibus utrinque 5–7, sensim arcuatis, supra leviter impressis, subtus prominulis; petiolus 1–1·6 cm. longus, supra convexus, minute pubescens, basi glandulis papillosis praeditus. *Panicula* terminalis vel axillaris, usque ad 20 cm. longa, pedunculo 3·5–9 cm. longo incluso, omnino minute pubescens, bracteis ovatis acutis 1–2 mm. longis. *Calycis* lobi rotundati, minute pubescentes, ciliati, 2 mm. longi, intus basi cujusque lobi squama unica, vel gemina, membranacea deltoidea praediti. *Corollae* tubus 4 mm. longus, extra intusque glaber; lobi dextrorsum obtegentes, 3 mm. longi, 1 mm. lati, apice obtusi, extra sparse setulosi, intus glabri. *Staminum* filamenta 0·5 mm. supra basin tubi inserta, inter se libera, villosa, c. 1 mm. longa; antherae semiexsertae, 3·5 mm. longae, apice acutae, basi in appendiculas obtusas divergentes productae. *Disci* squamellae 5, discretae, carnosae, apice rotundatae, 0·75 mm. altae. *Carpella* connata glabra, 1·5 mm. alta; stylus gracilis, 2 mm. longus; stigma cylindraceum, c. 1 mm. longum, basi membrana cupuliformi reflexa cinctum. *Fructus* immaturus solum visus, 10 cm. longus, carpellis cohaerentibus, apice sensim attenuatus.

Pang-nga, Kao Katakwam, c. 400 m., climbing in evergreen forest, *Kerr* 18496.

Wrightia lanceolata *Kerr* (Apocynaceae-Parsonsieae); a *W. coccinea* Sims floribus minoribus petalis pro rata angustioribus inter alia distinguenda.

Frutex c. 2 m. alta, ramulis juventute compressis puberulis. *Folia* lanceolata, apice sensim attenuata acuta, basi late cuneata vel subrotundata, 6–9 cm. longa, 2–2·8 cm. lata, chartacea, supra parce minuteque puberula, subtus pubescentia, costa supra leviter impressa subtus prominente, nervis lateralibus utrinque 12–16, supra inconspicuis subtus prominentibus, subparallelis, prope marginem arcuatis, rete nervarum supra obscuro subtus prominulo; petiolus c. 2 mm. longus, supra concavus, minute puberulus, basi glandulis 2–3 papilliformibus instructus. *Inflorescentia* 1–3-flora, subterminalis, sessilis, bracteis minutis, pedicellis 4–6 mm. longis, cum calyce minute puberulis. *Calycis* lobi ovati subacuti ciliati, 2 mm. longi, intus basi squamis 5 membranaceis subquadratis apice sinuatis,

c. 1 mm. altis, 1 mm. latis, instructi. *Corolla* hypocrateriformis, rubra ; tubus 2·5 mm. longus, intus glaber, extra prope apicem minute papillosus ; lobi oblongo-elliptici, 16 mm. longi, 8 mm. lati, omnino minute papillosi ; coronae segmenta bina, inaequaliter bifida, circa 2 mm. longa, paulo supra basin cujusque lobi inserta. *Stamina* ad apicem tubi affixa, filamentis glabris 1 mm. longis ; antherae exsertae anguste sagittatae 7 mm. longae, dorso dimidio superiore densae pilosae. *Carpella* connata 1·75 mm. alta ; stylus 5 mm. longus ; stigma c. 2 mm. longum. *Fructus* carpellis cohaerentibus, c. 15 cm. longus, striatus ; semina 10–11 mm. longa, apice obtusa, basi coma albida ornata.

Prachuap, Sam Roi Yawt, c. 50 m., on rocky limestone hill, *Kerr* 10926 (*type*, flower), *Put* 2514 (fruit).

Wrightia viridiflora *Kerr* (Apocynaceae-Parsonsieae) ; affinis *W. laevi* Hook. f., a qua floribus minoribus, filamentis coronae pro rata brevioribus inter alia differt.

Frutex vel *arbuscula* ramulis juventute leviter compressis sparse pubescentibus. *Folia* late elliptica vel ovata, apice breviter obtuseque acuminata, basi late cuneata vel rotundata, 3·5–10 cm. longa, 2–4·8 cm. lata, membranacea, supra glabra, subtus sparse pubescentia, nervis lateralibus utrinque c. 7, cum costa supra parum impressis subtus prominentibus ; petiolus 3–4 mm. longus, breviter pubescens. *Inflorescentia* ut videtur terminalis, 3–6-flora, usque ad 1·5 cm. longa, breviter puberula, pedunculo communi subnullo, ramis 1·5–2 mm. longis, pedicellis gracilibus 6–8 mm. longis, bracteis ovatis circa 1 mm. longis. *Calyx* lobis late deltoideis, 1·5 mm. longis, intus squamis 5 lobatis membranaceis instructus. *Corolla* pallide viridis ; tubus 1·5–2 mm. longus, extra intusque glaber ; lobi oblongi apice rotundati, ciliati, 5 mm. longi, 3 mm. lati, alabastro sinistrorsum obtegentes ; coronae filamenta 2-seriata, serie altera parum supra basin lobi inserta, altera ad sinum inter lobos affixa, usque ad 2 mm. longa. *Stamina* ad apicem tubi affixa, filamentis crassis glabris, 0·5 mm. longis ; antherae exsertae, anguste sagittatae, 3 mm. longae, loculis basi in appendiculas breves incurvas productis, connectivis dorso glabris, ventre parce pilosis. *Carpella* libera glabra 1 mm. alta, stylo cum stigmate 2·25 mm. longo. *Fructus* ignotus.

Saraburi, Muak Lek, *Put* 3086.

Strophanthus siamensis *Kerr* (Apocynaceae-Euechitideae) ; affinis *S. perakensi* Scortechini, a quo corollae lobis brevioribus, calycis lobis haud acuminati differt.

Frutex scandens, inflorescentia excepta glaber ; ramuli teretes, lenticellis pallidis subrotundatis prominulis copiose obsiti. *Folia* oblongo-elliptica vel oblongo-oblanceolata, apice breviter obtuseque acuminata, basi cuneata, usque ad 10 cm. longa, 3·2 cm. lata, chartacea, supra nitidula statu sicco viridi-brunnea, subtus opaca multo pallidiora, costa supra impressa, subtus prominente, nervis lateralibus

utrinque 12–15 inconspicuis, fere rectis vel leviter arcuatis, angulo 85°–90° a costa orientibus ; petiolus c. 2 mm. longus, supra alte canaliculatus, basi 1–2 glandulis papilliformibus munitus. *Inflorescentia* terminalis, cymosa, 3–8-flora, 4-6·5 cm. longa, pedunculo 2–3 cm. longo incluso, pedunculis, bracteis et pedicellis minute puberulis ; bracteae oppositae secus pedunculos secundarios distanter dispositae, ovatae acutae 1·5–3 mm. longae ; pedicelli 1·5–2 mm. longi. *Calyx* 5-partitus, extra minute puberulus, lobis ovatis subacutis 3 mm. longis, intus basi glandulis 5–6 parvis praeditus. *Corollae* tubus inferne cylindricus, superne infundibuliformis, 6·5 mm. longus, extra glaber, intus callis 5 guttiformibus, infra staminum insertionem dispositis, puberulis instructus, ceterum glaber, fauce squamis quinque, 0·75 mm. altis, late bifurcatis, praeditus. *Stamina* 4 mm. supra basin tubi inserta ; filamenta 0·5 mm. longa, exigue pilosa ; antherae 1·5 mm. longae, connectivo retrorsum piloso superne in appendicem filiformem pilosam 3·5 mm. longam producto. *Carpella* 1 mm. alta, apice rotundata, breviter pilosa ; stylus glaber 4 mm. longus, infra stigma leviter dilatatus ; stigma cylindricum, apice apiculatum, 1 mm. longum. *Fructus* ignotus.

Sriracha, evergreen forest, c. 100 m., *Kerr* 4173.

Ichnocarpus fulvus *Kerr* (Apocynaceae-Euechitideae) ; species corollae lobis brevibus, in alabastro haud deflexis, distincta.

Frutex scandens, dense fulvo-tomentosus. *Folia* elliptica vel lanceolata, leviter acuminata, basi rotundata, apice acuta, chartacea, 3·5–6·5 cm. longa, 1–2·6 cm. lata, sicco supra viridi-brunnea subtus fulva, subtus ad costam nervosque dense fulvo-tomentosa ceterum pilis mollis obsessa, punctata, supra pilis sparsius instructa, costa ut nervis supra impressa, subtus prominula, nervis lateralibus utrinque 5–7, angulo 45° a costa ascendentibus, prope marginem arcuatis ; petiolus 2–3 mm. longus, crassus, dense fulvo-tomentosus. *Inflorescentia* terminalis, conferta, 1–2 cm. longa, pedunculo 5–7 mm. longo, ut pedunculis secundariis bracteisque fulvo-tomentoso, pedunculis secundariis c. 2 mm. longis, bracteis ovatis 2–3 mm. longis, pedicellis brevissimis. *Calycis* lobi oblongi, obtusi, 2·5 mm. longi, extra tomentosi, intus glabri basi glandulis minutissimis paucis praediti. *Corolla* flava (ex *Marcan*) ; tubus 3·5 mm. longus, medio inflatus, extra pubescens, intus pilis paucis ad partem inflatam exceptis glaber ; lobi breviter obtuseque falcati, 1·5 mm. longi, 3 mm. lati. *Stamina* paulo infra medium tubi affixa, inclusa ; antherae ovatae, breviter apiculatae, 1·25 mm. longae ; filamenta brevissima. *Disci* lobi lineares, distincti, carpella superantes, 1 mm. alti. *Carpella* 0·5 mm. alta, apice pilosa. *Fructus* ignotus.

Sriracha, clearing on hillside, *Marcan* 1361.

In the shape and aestivation of its corolla lobes this species resembles *Parabarium* rather than *Ichnocarpus*, but the disc is that of *Ichnocarpus*.

Ichnocarpus uliginosus *Kerr* (Apocynaceae-Euechitideae) ; a speciebus ceteris inflorescentiis axillaribus paucifloris foliis multo brevioribus distinguenda.

Frutex scandens ramosus, ramulis primo compressis minute puberulis, mox teretibus glabris. *Folia* anguste elliptica vel oblanceolata, apice acuta, minute mucronata, basi anguste cuneata, 4–5·5 cm. longa, 0·7–1·3 cm. lata, glabra, statu sicco supra subnitida, subtus pallidiora opaca, costa supra impressa, subtus prominente, nervis lateralibus utrinque 5–7, supra obscuris subtus prominulis, angulo 30° a costa ascendentibus, leviter arcuatis ; petiolus c. 1·5 mm. longus, juventute pilis appressis, praesertim prope apicem, instructus. *Inflorescentia* vulgo axillaris, rarius terminalis, 2–6-flora ; pedunculus 1–3 mm. longus, pilis appressis instructus ; pedunculi secundarii brevissimi ; bracteae deltoideae leviter puberulae vel fere glabrae, 1 mm. longae ; pedicelli 0·5–1 mm. longi. *Calycis* lobi deltoidei subacuti, 1·5 mm. longi, glabri nisi ad apicem pilis paucis ornati, intus basi glandulis minutis paucis praediti. *Corolla* alba ; tubus medio leviter inflatus, 3 mm. longus, extra intusque glaber ; lobi patentes, falcati, apice acute acuminati, glabri, 5·5 mm. longi, 1 mm. lati. *Stamina* ad medium tubi affixa, inclusa ; antherae 1 mm. longae, breviter mucronatae ; filamenta 0·5 mm. longa, glabra. *Discus* anguste annularis, lobis linearibus 5, haud clavatis, 0·6 mm. longis, carpella leviter superantibus, munitus. *Carpella* 0·5 mm. alta, apice hirsuta, stigmate conico, cum stylo perbreve 1·3 mm. longo. *Folliculi* veteres, seminis delapsis, 10 cm. longi, pericarpio tenui striato glabro, haud stipitati apice longe attenuati. *Semina* haud visa.

Raheng, Kao Padang, c. 120 m., climbing on low bushes round marsh, *Kerr* 2979.

Aganosma breviloba *Kerr* (Apocynaceae-Euechitideae) ; ab affini *A. elegante* G. Don floribus majoribus tubo corollae pro rata longiore differt.

Frutex scandens, ramulis novellis sparse adpresse strigosis, mox glabris, cortice nigro-brunneo leviter striato obtectis. *Folia* elliptica vel obovata, apice abrupte breviter acuteque acuminata, basi acute cuneata, 5–9 cm. longa, 3–4·7 cm. lata, chartacea, glabra, sicco supra brunnea subtus pallidiora, costa supra impressa subtus prominente, nervis lateralibus utrinque 6–8, patentibus, leviter arcuatis, supra inconspicuis subtus prominulis, rete nervarum subtus subconspicuo ; petiolus 7–10 mm. longus, supra alte convexus, glaber. *Inflorescentia* terminalis, ramosa, multiflora, usque ad 6 cm. longa et lata, ramulis puberulis, bracteis cito deciduis, pedicellis 4–8 mm. longis pubescentibus. *Calycis* lobi sub anthesin patentes, lineares, acuti, 11 mm. longi, 1·5 mm. lati, utraque pagina pubescentes, intus basi glandulis paucis obpyriformibus instructi. *Corolla* alba ; tubus 11 mm. longus, infra medium sensim ampliatus, basi contractus, extra pubescens, intus superne dense pilosus ; lobi ovati, subacuti, 5 mm. longi, 2·5 mm. lati, pagina utraque velutini.

Stamina infra medium tubi affixa, inclusa ; antherae anguste sagittatae, 5·5 mm. longae ; filamenta perbrevia, pilosa. *Discus* cupuliformis, carpella multo superans, apice 5-lobatus, 1·75 mm. altus. *Carpella* apice pilosa ; stigma 3 mm. longum, basi cupuliforme, apice apiculatum. *Fructus* non visus.

Doi Sutep, 750 m., evergreen forest, *Kerr* 3211.

Aganosma montana *Kerr* (Apocynaceae-Euechitideae) ; species *A. radiatae* Merrill affinis, a qua foliis minoribus, corollae tubo pro rata breviore inter alia differt.

Frutex scandens ; ramuli primo adpresse hirsuti, cito glabrescentes, cortice nigrescente leviter rugoso lenticellis rotundatis sparse instructo obtecto. *Folia* elliptica vel oblonga, apice subito acute acuminata, basi cuneata, 7·5–10 cm. longa, 3–4·5 cm. lata, chartacea, olivacea, glabra, costa supra impressa, subtus prominula, nervis lateralibus utrinque 8–9, patulis, leviter arcuatis ; petiolus 1–1·5 cm. longus, primo adpresse hirsutus, cito glaber. *Inflorescentia* cymosa terminalis, 8–14-flora, puberula, usque ad 7 cm. longa, 9 cm. lata, breviter pedunculata ; bracteae cito deciduae, oblongae, subacutae, 10 mm. longae, 4 mm. latae, puberulae ; pedicelli 9–10 mm. longi, pubescentes. *Calycis* lobi sub anthesin patentes, lanceolati, 12 mm. longi, 4 mm. lati, utraque pagina puberuli, basi glandulis obpyriformibus paucis praediti. *Corollae* tubus leviter sulcatus, infra medium parum dilatatus, basi contractus, 12 mm. longus, extra breviter tomentosus, intus dense villosus ; lobi alabastro leviter sinistrorsum torti, dextrorsum obtegentes, sub anthesin patentes, inaequaliter obovati, 14 mm. longi, 9 mm. lati, basi villosi. *Stamina* infra medium tubi inserta, inclusa, antheris anguste sagittatis, 6·5 mm. longis. *Discus* cupuliformis, apice parum inaequaliter tamen valde 5-lobatus, glaber, 1·75 mm. altus. *Carpella* glabra, discreta, 0·75 mm. alta ; stylus 2·5 mm. longus ; stigma 3·25 mm. longum, apice apiculatum. *Fructus* non visus.

Krat, Kao Kuap, *Put* 2868.

Anodendron nervosum *Kerr* (Apocynaceae-Euechitideae) ; species *A. affini* (Hook. et Arn.) Druce accedens, foliis pro longitudine latioribus, nervis numerosis distinguenda.

Frutex scandens, floribus exceptis omnino glaber, ramulis juventute compressis mox teretibus, cortice crebre longitudinaliter sulcato statu sicco nigro-brunneo obtectis. *Folia* elliptica, oblonga, vel oblanceolata, apice breviter obtuseque acuminata, basi cuneata, 6·3–9·4 cm. longa, 2·7–3·6 cm. lata, chartacea, sicco supra olivacea subtus pallidiora, costa supra leviter impressa, subtus prominula, nervis lateralibus utrinque 18–25, angulo c. 70° a costa ascendentibus, fere rectis, prope marginem obscure anastomosantibus, supra obscuris, subtus conspicuis vix elevatis ; petiolus 10–15 mm. longus, supra leviter convexus. *Inflorescentia* terminalis paniculata, usque ad 15 cm. longa, 9 cm. lata, pedunculo communi ad 4·5 cm. longo ; bracteae anguste triangulares, 1–1·5 mm. longae ; pedicelli

1·5–2·5 mm. longi. *Calyx* glaber, intus ad quemque sinum glandula parva praeditus, lobis subobtusis 1 mm. longis. *Corolla* hypocrateriformis pallide viridula ; tubus 3·5 mm. longus, infra medium leviter ampliatus, basi constrictus, extra glaber intus villosus ; lobi lineares, parum inaequilaterales, apice obtusi, 7 mm. longi, 1·75 mm. lati, supra velutini, subtus glabri. *Stamina* prope basin tubi inserta, inclusa ; antherae sagittatae, apiculatae, 1·25 mm. longae. *Discus* breviter 5-lobatus, 0·25 mm. altus, carpella aequans. *Carpella* glabra ; stigma basi cupuliforme, apice breviter apiculatum, cum stylo 1·25 mm. altum. *Folliculi* continui vel parum reflexi, crassiusculi teretes, e basi rotundata sensim attenuati, c. 10 cm. longi ; semina compressa ovata, rostro excepto 18 mm. longa, 6 mm. lata, apice in rostrum gracile 15–30 mm. longum, coma alba e dimidio superiore oriente ornatum, producta.

Dan Sai, Pu Lom Lo, c. 1500 m., evergreen forest, *Kerr* 5784.

Anodendron sutepense *Kerr* (Apocynaceae-Euechitideae) ; affine *A. manubriato* (Wall.) Merrill, sed inflorescentia foliis breviore disco altius lobato differt.

Frutex scandens, floribus exceptis omnino glaber, ramulis novellis compressis longitudinaliter sulcatis. *Folia* saepius oblanceolata, apice breviter obtuseque acuminata, basi in petiolum sensim attenuata, 9–14·5 cm. longa, 3·6–5·5 cm. lata, tenuiter chartacea, statu sicco supra olivacea, subtus pallidiora, costa supra prominula vel leviter convexa, subtus prominente, nervis lateralibus utrinque 10–12, angulo c. 60° a costa ascendentibus, supra subtusque leviter prominulis, parum arcuatis ; petiolus 1–1·8 cm. longus, supra convexus. *Inflorescentia* terminalis paniculata, usque ad 8 cm. longa, 8 cm. lata, pedunculo communi 0·5–2·5 cm. longo ; bracteae anguste ovatae, c. 1 mm. longae ; pedicelli 1·5–2·5 mm. longi. *Corolla* hypocrateriformis, viridis ; tubus 2 mm. longus, extra glaber, intus villosus ; lobi oblongi, parum inaequilaterales, apice obtusi uno latere apiculati, margine obtecto minute eroso-ciliati. *Stamina* prope basin tubi inserta, inclusa, subsessilia, antheris sagittatis c. 1 mm. longis. *Discus* alte 5-lobatus, interdum lobis duobus connatis ceteris discretis, 0·5 mm. altus, carpella superans. *Carpella* glabra, stylo cum stigmate obpyriformi 0·75 mm. longo. *Fructus* ignotus.

Doi Sutep, 1650 m., evergreen forest, *Kerr* 1748.

XIV—NEW PLANTS FROM TIBET AND SIKKIM.

C. E. C. Fischer and H. Fröderström.

In the course of an expedition into Tibet in August and September 1935, Messrs. C. S. Cutting and A. S. Vernay made a very interesting collection of nearly 200 specimens. Of these 9 have proved to be new species. Three of the new species had been found by previous collectors but had remained undescribed. In addition a *Corydalis*

is probably new but the material is insufficient to warrant publication. This applied with less confidence to several other specimens. Two new species of *Gentiana* will be published shortly by Mr. C. V. B. Marquand in "Hooker's Icones Plantarum."

Opportunity is taken to include a new species of *Sedum*, kindly described by Dr. H. Fröderström, which was collected during the 1924 Expedition to Mount Everest.

Clematis Vernayi *C. E. C. Fischer*, sp. nov. [Ranunculaceae]; a *C. acutangula* Hook. f. et T. caulibus haud acuto-angulatis, pinnis foliorum 1–3-jugatis, foliolis haud crenato-serratis haud acutis, sepalis majoribus intus pubescentibus recedit.

A climbing *bush*; stem terete, longitudinally ribbed, up to 3 mm. diam., pubescent, purple or purplish-brown. *Leaves* opposite, biternate, 4–12 cm. long; petiole (4–6 cm. long), rhachis and petiolules (4–10 mm. long) pubescent; leaflets lanceolate and entire, or ovate and deeply 2–5-lobed, subacute or obtuse, base attenuate or rounded, 1·5–3 cm. long, 1–1·7 cm. wide, sparsely appressed-pubescent, usually 3-nerved from the base, nerves somewhat raised below, margins sometimes slightly toothed. *Flowers* solitary, axillary, often several on short axillary, leafy branchlets, 3·5–4·5 cm. diam.; pedicels 1·5–6 cm. long, terete, ribbed, pubescent, either bractless or with a pair of oblong or spathulate-oblong, shortly petioled bracts up to 1 cm. long, at or near the base. *Sepals* 4, rarely a smaller fifth added, corolline, yellow, elliptic to elliptic-ovate, subacute, 1·6–2·4 cm. long, 0·8–1·4 cm. wide, glabrous or with a few hairs without, densely grey-pubescent within. *Stamens* numerous; filaments linear, 1-ribbed, 4–4·5 mm. long, shortly silkily hairy; anthers oblong, 2 2·5 mm. long, glabrous. *Pistil* 1 cm. long densely silvery and silky; ovary very short, ellipsoid. *Achenes* not seen.

Tibet: 12 miles N.W. of Gyantse towards Shigatse, 13,000 ft., fls. Aug., *C. S. Cutting and A. S. Vernay* 57. "The only yellow-flowered *Clematis* seen, growing on side of road with *C. orientalis*."

Oxytropis sericopetala *C. E. C. Fischer*, sp. nov. [Papilionaceae]; *O. Thomsoni* Benth. ex Baker affinis, foliolis ellipticis, petalis dorso sericeis, legumine breviore elliptico-ovato recedit.

A tufted *herb*; rootstock woody, up to 20 cm. long, 5 mm. diam.; stems 2–4, up to 2 cm. long, more or less grey-woolly. *Leaves* 7–20 cm. long; petioles 2–9 cm. long, with the rhachis silvery or buff-tomentose; leaflets 10–15 pairs, sessile or subsessile, the lower larger and distant, more or less imbricate towards the smallest terminal one, elliptic, acute, 6–25 mm. long, 2–7 mm. wide, silvery- or buff-villous, nerves few, very obscure; stipules lanceolate, acuminate, 1–1·5 cm. long, silvery- or buff-villous. *Peduncles* axillary, 4–20 cm. long, stouter than the petioles, silvery- or buff-villous-tomentose. *Spike* dense throughout or a few of the lower flowers scattered and distant, 1·5–8 cm. long; bracts linear, acuminate, 2·5 mm. long, villous. *Flowers* sessile. *Calyx* silvery-villous without,

glabrous within ; tube tubular, 3·5 mm. long ; lobes linear-ensiform, 4·5–5 mm. long. *Corolla* much exserted, blue-purple, all the petals silky-villous on the back ; standard obcordate, sinus very narrow, 10·5–11·5 mm. long, 6–7 mm. wide ; wings oblong, apex rounded, with a lateral rounded lobe, 9·5 mm. long, 3·5 mm. wide, claw long, narrow ; keel 7·8–8·5 mm. long, its petals cohering throughout, sharply beaked, the apex usually curved outwards, shaggy towards the apex ; anthers small, muticous ; ovary shortly stipitate, linear, 4 mm. long, villous ; ovules 8 ; style subulate, upcurved, 3–3·3 mm. long, glabrous except at the base ; stigma minute, capitate. *Pod* elliptic-ovate, compressed, densely silky, tipped with the style, 6·5 mm. long, 4 mm. wide. *Seed* solitary (always ?) discoid, nearly filling the cavity.

Tibet : Shigatse, 12,800 ft., fls. and young frt. Sept., *C. S. Cutting and A. S. Vernay* 91 (type in Herb. Kew.), " common " ; Lhasa, 11,500 ft., *L. A. Waddell* ; Gyantse Hill, *H. M. Stewart* ; Gyantse, *Capt. H. J. Walton* (the last 3 are without numbers).

Sir David Prain established the novelty of this species and proposed the appropriate name adopted. It should make a handsome rock-garden plant.

Sedum petiolatum *H. Fröderström*, sp. nov. [Crassulaceae] ; species gregis *Primuloides* fortasse *S. Karpelesae* Hamet proxima, differt autem ab omnibus speciebus hujus gregis : foliis longe petiolatis, inflorescentia corymbosa satis multiflora, sepalis angustioribus, petalis superne denticulatis et squamis stipitato-spathulatis. Itaque, meo sensu, species nova himalensis.

Planta perennis glabra, caules steriles non edens. *Caudex* crassus, brevis latusque. *Folia caudicis* squamiformia : aut longe triangulari linearia, acuminata, usque ad 17 mm. longa, aut late linearia, apice parum dilatata et obtusa, 6–7 mm. longa. *Caules floriferi* 3–4 cm. longi, simplices, erecti, graciles ; eorum folia basalia longe angusteque petiolata (petiolo circiter 15 mm. longo), laminis reniformi-orbicularibus apice obtusissimis circiter 15 mm. longis ; folia itaque in toto circiter 30 mm. longa. *Folia media* et *superiora* ignota. *Inflorescentia* dense vel laxe corymbosa ; bracteae linearilanceolatae, circiter 4 mm. longae. *Flores* pro planta magni, anisopentameri. *Sepala* basi non producta, suboblongo-triangularia, apice acuminata, circiter 4 mm. longa. *Petala* fere libera, subovata, in parte superiore denticulata, apice satis longe mucronata, 6–7 mm. longa, alba. *Stamina* omnia 4·5–5 mm. longa, epipetala, 1 mm. supra basin inserta ; antherae oblongae, subapiculatae. *Squamae nectariferae* longe lateque stipitatae, apice dilatatae et obtusae, crassae, in sicco fuscae, circiter 1 × 0·4 mm. *Carpella* immatura erecta, satis longistyla, subovata, circiter 4 mm. longa. *Semina* ignota.

Tibet : Rongshar valley, 13,000 ft., fls. Sept., *Major R. W. G. Hingston* 51 (Mt. Everest Expedition 1924).

Sedum sangpo-tibetanum *H. Fröderström*, sp. nov. [Crassulaceae]; species vero distincta, gregis *Primuloides* Franch., fortasse *S. Karpelesae* Hamet proxima, differt autem: foliis basalibus lineari-lanceolatis, inflorescentia multiflora, sepalis oblongis et carpellis fere ad basin liberis.

Planta perennis, parva, alpina, glabra, usque ad 5 cm. alta. *Radices* fibratae, usque ad 20 cm. longae. *Caudex hypogaeus* brevis et latus, apice squamis desiccatis late triangularibus cinctus. *Caudex epigaeus* latus et brevis; ejus folia partim semidesiccata, apice fracta, partim recentia, viridia, lineari-lanceolata, basi dilatata, apice subacuta, 15–20 mm. longa. *Caules floriferi* centrales, erecti, 3–4 cm. longi; eorum folia alterna, lineari-lanceolata, basi obtuse calcarata, apice subobtusa, 10–15 mm. longa. *Inflorescentia* late corymbosa, multiflora, foliosa, circiter 15 × 20 mm.; bracteae lanceolatae, 6–6·5 mm. longae. *Flores* ansiopentameri, breviter pedicellati. *Sepala* basi non producta, oblonga, apice subobtusa, circiter 4 mm. lata. *Petala* subovata, basi lata, apice late mucronata, circiter 5 mm. longa, in sicco lutea. *Stamina* epipetala prope basin inserta, 3 mm. longa; stamina interpetala 5 mm. longa vel saepe in staminodia 2 mm. longa redacta; antherae oblongo-reniformes, obtusae. *Squamae nectariferae* subspathulato-quadratae, apice obtusissimae, 1 × 0·9 mm. *Carpella* fere libera, erecta, oblonga, longistyla, 6–6·5 mm. longa; folliculi pauciseminati, placentis rite ligamentosis. *Semina* oblonga vel ovata, utrinque alata, 1 × 0·4–0·5 mm., glabra.

Tibet: Shigatse, mountain side of Tsang-po, fls. and frt. Sept., *C. S. Cutting and A. S. Vernay* 97A.

Sedum shigatsense *H. Fröderström*, sp. nov. [Crassulaceae]; species gregis *Roborowskia* Frød., differt autem ab omnibus speciebus adhuc cognitis: caulibus usque ad 10 cm. longis, foliis magnis obtusisque, petalis submucronatis et carpellis fere liberis.

Planta annua ?, alpina, glabra, erecta, e basi pauciramosa, usque ad 10 cm. longa. *Caules steriles* non visi. *Caules floriferi* basi nudi, supra medium dense foliosi. *Folia media* subovata, basi obtuse calcarata, apice obtusa, usque ad 10 mm. longa; folia superiora minora, apice subobtusa, circiter 4 mm. longa. *Inflorescentia* subcorymbosa, pauciflora; bracteae oblanceolatae, subobtusae, 3 mm. longae. *Flores* anisopentameri, breviter pedicellati (3–5 mm.). *Sepala* basi breviter obtuseque calcarata, subovata, apice obtusa, parum inaequalia, 3–3·5 mm. longa. *Petala* prope basin connata, subovata, apice submucronata, circiter 4 mm. longa, in sicco distincte lutea. *Stamina* omnia circiter 3–5 mm. longa, epipetala 0·5 mm. supra basin inserta; antherae ovato-reniformes, apice subacutae, 0·75 mm. longae. *Carpella* (immatura) erecta, brevistyla, non gibbosa, prope basin connata, circiter 3 mm. longa; folliculi multiovulati, placentis rite ligamentosis. *Semina* non visi.

Tibet: Shigatse, bank of Tsang-po, fls. Sept., *C. S. Cutting and A. S. Vernay* 62.

Doronicum latisquamatum *C. E. C. Fischer*, sp. nov. [Compositae]; a *D. thibetano* Cav. foliis caulinis basi haud constrictis, involucri bracteis multo latioribus, ligulis angustissimis recedit.

An erect *herb* 20–30 cm. high ; stem slender, terete, brown or purplish, grey-pubescent with crisped multicellular hairs. *Leaves* : basal not seen ; cauline about 6, alternate, distant 3–6 cm., membranous, green, sessile, oblong, sometimes somewhat oblique-ovate, obtuse with a minute apiculum, base suncordate or rounded, amplexicaul, 1·6–4·2 cm. long, 0·8–2·2 cm. wide, hispidulous above, pubescent below, not glandular, 5–7-nerved from the base, the inner one on each side of the midrib continued to the apex, veins much reticulated, obscure above, margins more or less sinuate-crenate with apicula from the sinuses. *Head* solitary, 3–4 cm. above the uppermost leaf, campanulate, 3·5–4 cm. diam. *Involucral bracts* about 17 in 2–3 series, those of the outer rows lanceolate to ovate-lanceolate, subacute, 13–19 mm. long, 5–7 mm. wide, hispidulous without, glabrous within except near the tip, green with purplish margins and tip outside when dry, the innermost row usually a little shorter, much narrower, acuminate, indumentum as in the outer except for the narrow hyaline glabrous margins. *Disk* flat, naked, pitted. *Ray florets* in 1–3 series ; corolla ligulate, 14 mm. long, 0·7 mm. wide, very shortly, bluntly 2–3-toothed, tube 2 mm. long ; pappus brown (at least when dry) 5 mm. long, minutely ascendingly barbellate ; ovary fertile, elliptic to narrowly turbinate, compressed truncate, shortly stipitate, 1·7 mm. long, hairy ; style very slender, arms erect, linear, flat, acuminate, glabrous. *Disc florets* narrowly funnel-shaped above a short cylindrical base, 4·5 mm. long, lobes 5, short, triangular, acute ; anthers 2 mm. long, acuminate, base entire ; style arms narrowly spathulate, minutely papillose ; pappus and fertile ovary as in the ray florets, ovary rather more slender. *Achenes* not seen.

India : Sikkim, Tsamgo Lake, 12,000 ft., fls. Aug., *C. S. Cutting and A. S. Vernay* 70. " Common all along route, sometimes at high altitudes very low on ground on rocky soil (rocky shale all around Lake Tsamgo)." The colour of the florets is not stated, but from the dried specimens it appears that the ray florets are purple above and brownish at the base and the disk florets yellow-brown.

Saussurea Kingii *C. E. C. Fischer*, sp. nov. [Compositae] ; *S. Thoroldi* Hemsl. similis sed caulibus ramosis, capitulis haud glomeratis, lobulis foliorum rotundatis, involucri bracteis 4–5-seriatis, seriebus 2 exterioribus extus puberulis apice rhomboideo-dilatatis, floribus numerosis recedit.

A branched *herb* ; rootstock woody, up to 10 cm. long and 5 mm. diam., stem short, branches spreading, up to 8 cm. long, striate, brown or purplish. *Leaves* alternate, sessile, linear in outline, 4–11 cm. long, 1–1·7 cm. wide, pinnatifid from 1–5 cm. above the base, lobes alternate or opposite, oblong, rounded, apiculate, margins entire or more or less lobulate, glabrous, midrib rather broad in

lower half, one lateral nerve running to the apex of each lobe. *Inflorescence* of several to many capitula in a terminal corymb ; peduncles 0·2 cm. long, sometimes subtended by a reduced leaf. *Capitula* campanulate, 1·5 cm. long, 1 cm. across. *Involucral* bracts in 4–5 rows ; outermost fleshy, 7–9 mm. long, narrowly lanceolate and keeled below, dilated above into a rhomboid expansion 3 mm. long, with acute, apiculate angles, rarely much larger and foliaceous ; the second row as long, ovate or broadly ovate, with wide purple membranous margins and a similar apical expansion ; third row broadly ovate, membranous, acute, 8 mm. long, purple and sometimes denticulate at the apex, puberulous on the back, at least in the middle, as are those of first and second rows ; fourth and fifth rows thinly membranous, slightly shorter, lanceolate, acute, glabrous. *Receptacle* convex, naked. *Florets* numerous ; ovary quadrate or cuneate, compressed, 1·5–2 mm. long, smooth, edges margined and scalloped, rarely with a very narrow scalloped wing down one face (sub-trigonous), glabrous ; style-arms short, linear, blunt, minutely puberulous ; pappus 2-seriate, a few outer deciduous, ascendingly barbellate bristles 3 mm. long and an inner ring of white-plumose bristles rather thick and pale-brown below ; corolla 8·5 mm. long, tube cylindric, slender below, slightly expanded in the apical 1/3, lobes 5, linear-ensiform, subacute, 3·5 mm. long ; anthers 4 mm. long, apiculate, tails united. *Achenes* similar to the ovary, brown, 1·7–2·5 mm. long.

Tibet : Lhasa, 12,000 ft., fls. and frt. Sept., *L. A. Waddell*, sine numero (type in Herb. Kew.) ; Numa, *H. M. Stewart* s.n. ; 4 miles N. of Shigatse, 12,800 ft., on sandy shale on side of road, *C. S. Cutting* and *A. S. Vernay* 72. The corollas appear to have been purple in life.

This plant was recognised as a new species by the late Mr. J. R. Drummond, who proposed the name ; though it is not clear why this name was proposed, I have accepted it as it has already been inscribed on herbarium sheets in the Kew Herbarium and elsewhere.

Androsace Cuttingii *C. E. C. Fischer*, sp. nov. [Primulaceae] ; ab *A. Wardii* W. W. Smith foliis sessilibus, bracteis supra basin insertis pedicellis subaequilongis, pedicellis et calycibus pilis capitatis praeditis recedit.

Perennial *herb* ; rootstock woody, up to 8 cm. long ; stems several, up to 4 cm. long, more or less densely clothed with the remains of old leaves. *Leaves* rosulate, densely imbricate, rigid, sessile, linear to linear-spathulate, acute or subacute, 5–15 mm. long, 2–5 mm. wide, midrib obscure, rather conspiciously silvery-hairy when young, later bright-green, pubescent or hispidulous, margins ciliate. *Inflorescence* of umbels of 4–10 flowers ; peduncles very short or up to 2 cm. long, puberulous or more or less white-hairy, sometimes with short capitate hairs intermixed, especially near the apex ; bracts several, linear- to spathulate-oblong, attached

slightly above the base, 2–4 mm. long, acute or subacute, hispidulous and sometimes with short capitate hairs intermixed ; pedicels 2·5–4 mm. long, hispidulous or pubescent and with short capitate hairs intermixed. *Calyx* 3–3·2 mm. long, puberulous and also bearing short capitate hairs without, glabrous within ; tube funnel-shaped, as long as the 5 subcircular or broadly ovate, subacute, white-ciliate lobes. *Corolla* white with yellow centre ; tube widely barrel-shaped to subglobose, 3·2–3·3 mm. long, constricted to a narrow mouth with a distinct lobulate rim ; lobes 5, spreading, broadly obovate, entire, 3 mm. long, shortly conjoined at the base. *Stamens* 5, inserted at the middle of the corolla-tube ; filaments very short ; anthers ovate-lanceolate, 1 mm. long. *Ovary* subglobose or somewhat top-shaped, 1·5–2 mm. long ; style 1–1·3 mm. long ; ovules about 10. *Capsule* subglobose, crustaceous, 4 mm. long, whitish ; seeds sub-cuneiform and angled or broadly ovate and flat, 2–2·5 mm. long, brown.

Tibet : four miles N. of Shigatse, on shale on mountain-side, 12,800 ft., fls. and frt. Aug.–Sept , *C. S. Cutting and A. S. Vernay* 75 (type in Herb. Kew.), 90 ; Raphu, in grassy valley, 15,000 ft., fls. white, yellow centre, June, *E. Norton* 19 (Mt. Everest Expedition 1922) ; Gyantse, fls. July–Sept., *H. J. Walton*.

XV—CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA : XXX.*

NEW SPECIES AND RECORDS FROM BRITISH GUIANA.—N. Y. SANDWITH.

The descriptions and notes which follow are based mainly on a collection made in the autumn of 1935 by Mr. T. A. W. Davis, Assistant Conservator of Forests, on the Upper Demerara River, where some interesting new trees were discovered on the low iron-stone ridges ; and on another valuable and beautifully dried set of herbarium specimens prepared by the entomologist, Mr. J. G. Myers, on his hazardous journey in the far interior in 1935-1936. Mr. Myers, who was searching for parasites of froghopper and of the yellow-headed cane-borer, at first worked on the Rupununi Savannahs where he collected many of the plants characteristic of this region. Later, following an arrangement with the Boundary Commission, he entered dense forests and crossed to the Kassikaityu River, and so to the Upper Essequibo at Onoro, near the Brazilian frontier. Here a meeting with the Commission failed to materialize and Mr. Myers, short of food and transport, without communications of any kind, and with only one reliable Indian to accompany him, accomplished a most dangerous journey down the New River to the base camp of the Commission at King Frederick William Falls on the Corentyne. Much of the country traversed during this journey has never before been visited by a white man, let alone

* Continued from K.B. 1937, 78.

by a botanist, although the limits were known to Robert and Richard Schomburgk a century ago. Mr. Myers' collection is therefore of the greatest interest and value, since—apart from novelties—he has re-discovered rare species which were collected by the Schomburgks, and has added others to the flora of the Colony which were known hitherto only from the Amazons region.

Capparidaceae.

Capparis (subgen. *Calyptrocalyx*) **surinamensis** *J. C. Went* apud Pulle in Rec. Trav. Bot. Néerl. **30,** 164 (1933), descr. emend. ac ampl. ex exemplis demerarensibus flores perfecte evolutos praebentibus.

Corymbi secus ramulos annotinos numerosi, aggregati, floribus corymborum inter sese intermixtis valde numerosis ; pedicelli sub flore expanso 1·3–2·2 cm. longi. *Alabastra* ovoidea, sub ruptione ad 6 mm. longa. *Sepala* exteriora late ovato-oblonga, obtusa, circiter 6·5 mm. longa, circiter 6 mm. lata ; interiora tenuiora, spathulata, obtusa, 6·5–7·5 mm. longa, 3–4 mm. lata. *Petala* obovato-spathulata, obtusa, unguiculata, stellato-pubescentia, 1–1·05 cm. longa, circiter 6 mm. lata. *Disci squamae* evolutae 4, oblongae, truncato-obtusae, senectute aliquantum emarginatae, ad 1 mm. longae atque 0·75 mm. latae. *Stamina* circiter 20 ; filamenta 7–7·5 mm. longa, basin versus sensim incrassata ibique satis dense stellato-pubescentia, superne fere glabra sed pilis stellatis raris praedita ; antherae oblongae, circiter 1·5 mm. longae atque 1 mm. latae. *Ovarium* 1-loculare, subglobosum, dense stellato-tomentosum, circiter 1·75 mm. diametro, longitudinaliter tenuiter crebre costulatum ; stipes 4·3–5 mm. longus, pubescens ; stigma terminale, sessile, orbiculatum, glabrum.

British Guiana. Great Fall, Demerara River, about 105 m. S. of Georgetown, alt. 200 ft. Oct. 25th 1935, *Davis* in *Forest Dept.* no. 2471 : tall tree about 130 ft. high and 20 in. diam., growing on the slope of an ironstone ridge on rocky soil in mixed forest ; scales on young leaves silvery ; inflorescence and outer sepals dull purple with silvery scales ; flowers creamy-white, petals faintly tinged with purple without. Vernacular name unknown.

The British Guiana material was obviously to be related to the remarkable new species of subgen. *Calyptrocalyx* which had recently been described from Surinam, but differed from the description in several important floral characters, viz. the structure of the disk, the indumentum of the filaments, and the shape and indumentum of the stipitate ovary. Comparison was therefore made with the type material of *C. surinamensis* which was kindly lent by the authorities of the Utrecht Herbarium. The flowers of the type, as admitted by Miss Went, were described from very young buds. Another bud has been dissected and compared with the characters of an almost equally young bud from the British Guiana tree. The result leaves little or no doubt that the material

from both colonies represents the same species and that the discrepancies between the description of the floral parts of *C. surinamensis* and those of the perfect flowers from British Guiana are due to the description having been made from extremely young and undeveloped buds. Thus the four scales or glands of the disk are sometimes very obscure in the young bud, but become obvious in the fully-opened flower ; while the filaments and the stipe of the ovary are apparently glabrous in the young bud. Again, the authoress had no opportunity of determining the nature of the shape of the mature ovary, since in the very young bud this organ is of the same thickness as its stipe, the whole gynoecium appearing linear and subsessile ; while the stellate-pilose lateral stigma of her description seems to refer to the indumentum of the undeveloped ovary which is later sharply distinguished from the glabrous terminal stigma. Both collections agree excellently in characters of the leaves and indumentum of the inflorescence, and the conclusion is that the British Guiana material can safely be identified with *C. surinamensis* and may be employed for an emended and amplified description as given above.

MALPIGHIACEAE.

Byrsonima Poeppigiana *Juss.*

Onoro, Upper Essequibo River, Nov. 24th 1935, *J. G. Myers* 5732 : riparian tree 50 ft. high, girth at breast height 2 ft.

Distr. Amazonian Brazil, Peru and Bolivia.

An interesting addition to the twelve species of the genus hitherto recorded from the Colony, see Kew Bull. 1935, pp. 311-316. The species should be placed in the key next to *B. Aerugo* Sagot, from which it is at once distinguished by the leaves which are not reddish-rusty and tomentose, but glabrescent and sparsely pubescent, on the lower surface. Further collection is desirable for confirmation of the above identification.

LEGUMINOSAE.

Swartzia longipedicellata *Sandwith*, sp. nov. ; in seriem *Orthostylearum* juxta *S. acuminatam* Willd. ex Vog. ponenda, propter foliola alterna, racemum pauciflorum, pedicellos longos, alabastra magna floresque multo majores distinctissima.

Arbor parva, ramulis annotinis teretibus glabratis hornotinis puberulis. *Folia* omnino glabra sed secus rhachin minute obscure lepidota, petiolo rhachi petiolulis siccitate nigrescentibus ; petiolus 3–4 cm. longus, gracilis, ad 2 mm. diametro, basi incrassatus ; internodia rhacheos subteretis nec alatae 3·8–6 cm. longa, gracilia ; petioluli 5·5–7 mm. longi ; foliola 7–9, alterna vel potius nunquam stricte opposita, oblonga, terminalia obovato-oblonga, apice conspicue (saepe ad 1·7 cm.) anguste caudato-cuspidata, basi in foliolis infimis obtusa vel rotundata in superioribus in petiolulum cuneata, 7–15·5 cm. longa, 3·5–6·6 cm. lata, firme chartacea, siccitate supra olivaceo-nigrescentia subopaca vel vix nitidula, subtus brunnea

pallidiora, utrinque glabra, costa supra canaliculato-impressa subtus prominente nigrescente, nervis lateralibus primariis circiter 6–7 utrinque tenuibus et praesertim supra a secundariis parallelis numerosis vix distinguendis patulo-adscendentibus tum longe (vulgo 6–10 mm.) a margine anastomosantibus et nervos limbales duplices formantibus supra fere planis inconspicuis subtus tenuiter prominulis, reticulatione tertiaria perobscura et sub lente tantum obvia sed areolis utrinque praesertim supra crebre verruculosis. *Racemi* infra folia e ramulis annotinis exorientes, pauciflori, ut videtur ad 5–6-flori ; rhachis ad 14 cm. longa, nonnunquam multo brevior, nigrescens, glabra vel parce pubescens, obscure minute lepidota, ad 2·5 mm. lata ; pedicelli similes, inferiores ad 5·2 cm. longi, superiores 2–3·8 cm. longi, crassi, saepe 2 mm. lati ; bracteae deltoideo-triangulares, pubescentes, parvae, vix ad 2 mm. longae ; bracteolae supra medium pedicellum (raro in medio pedicello) sed longe infra calycem affixae, haud oppositae, lanceolato-subulatae, pubescentes, minutae, circiter 1·5 mm. longae. *Alabastra* ovoidea usque ovoideo-subglobosa, siccitate pruinoso-nigrescentia, valde corrugulata et verruculosa, glabra vel saltem glabrata, fere ad 1·5 cm. longa, 1·1–1·2 cm. diametro. *Calyx* demum in lobos 4 reflexos utrinque glabros ad 1·8 cm. longos 6–9 mm. latos profunde fissus. *Petalum* album, magnum ; lamina utrinque glabra 2·5–3 cm. longa, 3·5–4 cm. lata. *Stamina* majora circiter 5–9, glabra, filamentis 2–3 cm. longis, antheris 2·5–3 mm. longis ; minora valde numerosa, glabra, filamentis circiter 1·4–1·7 cm. longis, antheris 1·5 mm. longis. *Gynoecium* omnino glabrum, siccitate nigrescens ; stipes 1·6–1·8 cm. longus ; ovarium lineari-oblongum, rectum vel paulo curvatum, 0·8–1·2 cm. longum, 2–2·3 mm. latum ; stylus circiter 1·1 cm. longus, curvatus. *Fructus* ignotus.

British Guiana. Demerara River : Karaba Creek, about 110 m. S. of Georgetown, alt. 100 ft., Oct. 13th 1935, *Davis* in *Forest Dept.* no. 2451. Noted as a small tree to about 40 ft. high, very slightly buttressed, with thin blackish bark, growing near the river-bank in rather low forest which is occasionally inundated. Calyx pale green without, creamy-white within. Petal dead white. Stamens golden-yellow ; anthers buff-white. Gynoecium whitish. Leaflets green below.

Vernacular name (Arawak), *Serebedan* (but this name is also given to *S. oblanceolata* Sandwith).

This extremely interesting new species, the nineteenth *Swartzia* to be recorded from British Guiana, runs down in the key to the species occurring in the Colony (see Kew Bull. 1934, 354–356) nearest *S. Schomburgkii* Bth. and *S. Jenmani* Sandwith. Affinity with these two species is clearly indicated by the general facies and venation of the leaflets, the glabrous white petal, and the form of the gynoecium with its long style ; both of them, however, differ widely on account of the indumentum of the lower surface of their strictly opposite leaflets and inflorescence, the short pedicels, and

the much smaller buds and flowers. A slightly closer ally is the Amazonian *S. acuminata* Willd. ex Vog. which has glabrous leaflets with a verrucular upper surface as in *S. longipedicellata*.

Swartzia Jenmani *Sandwith* in Kew Bull. 1934, 361.

Upper Demerara River, about 110 m. S. of Georgetown, alt. c. 200 ft., Oct. 14th 1935, *Davis* in *Forest Dept.* no. 2455.

Vernacular name (Arawak), *Parakusan* (this name is also given to *S. Schomburgkii* Bth.).

Mr. T. A. W. Davis, who has rediscovered this species, which was described from a single collection by Jenman in the same region, writes as follows: "This species is abundant and replaces *S. Schomburgkii* in this district, at least from Malali upwards. It is a large tree with deeply-fluted bole consisting of thin plank-like buttresses, about 100 ft. high and 30 in. in diam., growing in greenheart forest on brown sand soil. Petal milk-white; small stamens rich yellow with brown anthers, large ones white with cream anthers; gynoecium and calyx lobes creamy-white within; cauliflorous inflorescence, buds, young shoots and lower surface of leaflets with velvety, pale-brown indumentum."

The rediscovery of *S. Jenmani*, with full notes on its trunk and inflorescence, is highly gratifying, since the new material justifies its separation as a species from the very closely allied *S. Schomburgkii*. The chief diagnostic characters are all confirmed, but the style of *S. Jenmani* is shown to reach 1 cm. in length.

Swartzia grandifolia *Bong. ex Benth.*, var. **leiogyne** *Sandwith*, var. nov.; a planta typica gynoecio maturo omnino glabro differt.

British Guiana. Demerara River, about 110 m. S. of Georgetown, Oct. 21st 1935, *Davis* in *Forest Dept.* no. 2464 (typus): tree about 70 ft. high, 6 in. diam., in mixed forest on brown sandy loam soil; inflorescence cauliflorous; petal pale yellow with pale purple veins. Berbice-Demerara Cattle Trail Survey, June 1919, *Abraham* 215: tree 40 ft. high; standard cream with purple streaks; pod 12–18 in. long. Dense upland forest, Tumatumari, June–July 1921, *Gleason* 425; cauliflorous tree 40 ft. high.

The leaflets of these collections are conspicuously shining above, while the bracteoles are very minute, often attached at some distance below the base of the bud.

Vernacular name (Arawak), *Kerunite*.

Care must be taken to distinguish this variety from *S. xanthopetala* Sandwith, which differs especially in the wingless leaf-rhachis, the stronger indumentum of the leaflets and of the longer inflorescence, the larger bracts and the golden-yellow petal.

Vouacapoua macropetala *Sandwith*, sp. nov.; ab utraque specie adhuc descripta, et *V. americana* Aubl. et *V. pallidiore* Ducke, petalis multo majoribus, antheris longioribus, ovulis 2 differt; praeterea a *V. americana* foliolis pro rata latioribus, foliolorum nervis

lateralibus paucioribus haud patulis sed ascendentibus e costa angulo multo acutiore exorientibus, a *V. pallidiore* petalis glabris spathulatis distinguitur.

Arbor mediocris, ramulis apicem versus ferrugineo-pubescentibus. *Folia* petiolo, rhachi, petiolulis eis *V. americanae* et *V. pallidioris* similibus ; foliola in exemplis visis semper 7, oblongo-lanceolata, elliptico-oblonga vel rarius ovata, apice ut in *V. pallidiore* longe acuminata, basi rotundata vel saltem obtusa, 9–18·5 cm. longa, 3·3–7·4 cm. lata, firme chartacea, glabra, nervis lateralibus primariis circiter 7–9 ut in *V. pallidiore* ascendentibus longe a margine anastomosantibus, rete venularum paginae inferioris quam in *V. americana* minus prominulo. *Inflorescentia* indumento generis typico fulvo ; bracteae ad 2·5 mm. longae ; pedicelli 2·5–4 mm. longi. *Alabastra* matura siccitate flavo-fulvo-sericea, 4–6 mm. longa. *Calycis* tubus campanulatus, 2 mm. longus ; lobi late oblongi, obtusi, utrinque flavescenti-tomentelli, 5–5·5 mm. longi, 3–4 mm. lati. *Petala* flava, spathulata, basi unguiformi-attenuata, 7·75–8 mm. longa, 3·5–4 mm. lata, utrinque glabra. *Stamina* glabra ; filamenta seriei longioris 3·2–4·5 mm. longa, seriei brevioris 2·2–3 mm. longa ; antherae 2·2 mm. longae. *Ovarium* fulvo-tomentosum, oblongum, 3–5 mm. longum, ad 2 mm. latum, in stylum superne glabrum vel glabrescentem 1·3–1·5 mm. longum attenuatum ; ovula 2. *Fructus* ignotus.

British Guiana. Upper Demerara River, about 110 m. S. of Georgetown, alt. c. 100 ft., Oct. 18th 1935, *Davis* in *Forest Dept.* no. 2460 : tree about 85–90 ft. high, 16 in. diam., in mixed forest on sandy clay soil ; flowers yellow, the calyx inclining to orange-buff ; indumentum on inflorescence brownish, that on young fruit paler ; undersurface of leaflets inclining to glaucous.

Vernacular name (Arawak), *Sarabebeballi*.

The genus *Vouacapoua*, which was reinstated by Baillon in Adansonia, **9**, pp. 206–212, t. iv, is noted for the excellent hardwood of *V. americana*, both in French Guiana and in Amazonian Brazil, where it is known by the name Acapú. The second species, *V. pallidior*, was recently described by Dr. Ducke from material collected on the Rio Negro, where the trees were also known as Acapú, see Tropical Woods, no. **31**, pp. 15–16. Examination of Spruce's gathering (no. 2061) from San Gabriel on the Rio Negro shows that this collection must be referred to *V. pallidior*, as was surmised by Ducke.

Mr. Davis's discovery of a new *Vouacapoua* in British Guiana is apparently the first record of this genus for the Colony. His material shares certain characteristics of both of the hitherto described species, but differs from both in the much longer and somewhat broader petals, the longer anthers, and the longer ovary which bears 2 ovules. In *V. americana* and *V. pallidior* the petals are 4–5·5 mm. long and 1·9–2·5 mm. broad, the anthers are 1·4–1·75 mm. long, and the ovary is shorter and more ovoid and bears a single ovule.

Apart from these distinctions, the British Guiana plant is very similar to *V. pallidior* in the general facies and venation of the leaflets, which differ strikingly from those of *V. americana* in characters indicated in the above diagnosis and description. On the other hand, the petals of *V. pallidior* are rusty-pubescent in the lower half, expecially on the outer surface, whereas those of *V. americana* and the British Guiana material are glabrous. The leaves of the latter are uniformly 7-foliolate, whereas the larger leaves of *V. americana* and *V. pallidior* are 9-foliolate, or occasionally 11-foliolate in the former. The presence of 2 ovules, if constant, suggests a passage towards the monotypic genus *Batesia* which Baillon did not feel was really distinguishable from *Vouacapoua*. No Aublet specimen of *V. americana* has been found in the Herbarium of the British Museum.

Cassia racemosa *Mill.* sens. *Benth.*

Upper Essequibo River, between Camp 2 and Onoro, Nov. 22nd 1935, *J. G. Myers* 5709 ; a small slender riparian tree of the lowest storey.

Distr. Amazonian Brazil to Colombia, Peru, Bolivia and Paraguay. This is the first collection from British Guiana to be received at Kew, since *Robert Schomburgk* 895 is proved by his manuscript field notes to have been gathered at Pedrero, on the Rio Negro, Brazil.

Paloue induta *Sandwith*, sp. nov. ; a speciebus adhuc descriptis propter indumentum totius inflorescentiae, praeterea ovarium villosulo-lanato-tomentosum distincta ; species affines *P. riparia* Pulle floribus minoribus, bracteolis parvis, ovario glabro, *P. guianensis* Aubl. petalis valde distinctis gaudent.

Frutex riparius, ramulis cinnamomeis puberulis vel glabratis. *Folia* oblongo-lanceolata vel lanceolata, apice acuminata, basi subrotundata vel in exemplis parvis cuneata, usque ad 11 cm. longa ac ad 3·7 cm. lata (verosimiliter nonnunquam majora), tenuiter coriacea, glabra, venatione generis typica ; petiolus 3–4 mm. longus. *Racemi* solitarii axillares vel apice ramulorum 2–3 fasciculati, 4–6 cm. longi, rhachi pedicellisque pilis brevibus flavo-chryseis subnitentibus dense patule vel fere patenter pilosulis ; bracteae late ovatae, rotundato-obtusae, ad 8 mm. longae, extra dense pubescentes ; pedicelli 6–9 mm. longi ; bracteolae generis typicae, 7–10·5 mm. longae, extra dense griseo-pubescentes. *Calycis* stipes 7–11 mm. longus, pilis arcuato-ascendentibus dense pilosulus ; tubus 8–10 mm. longus atque latus, similiter indutus ; segmenta extra juventute pube grisea detersili induta, demum glabrata, intus siccitate purpurea, inaequalia, late ovata vel oblonga, obtusa, 1·3–1·5 cm. longa, 0·6–1·3 cm. lata. *Petala* 5 glabra, oblonga vel oblongo-linearia ; unum multo majus, acutum, 1·3–1·4 cm. longum, 3–5 mm. latum ; 2 minora, obtusa, 3·5–5 mm. longa, circiter 1·25 mm. lata ; 2 minima, obtusa, circiter 1·8 mm. longa atque 0·75 mm. lata. *Stamina* 9 ;

filamenta basi breviter (ad 1·5 mm.) aequaliter connata, aequalia, 4·8–5·3 cm. longa, pilis longis debilibus flexuosis laxe induta, superne glabrescentia ; antherae glabrae, 7–7·5 mm. longae, 1·5 mm. latae, apice apiculo rotundato-obtuso circiter 0·2 mm. longo terminatae. *Ovarium* pilis flavo-albis dense lanato-tomentosum, stipite glabro ; stylus basi indumento ovarii indutus, ceterum glaber, circiter 5–6·5 cm. longus. *Fructus* deest.

British Guiana. Upper Essequibo River : Mataruki River, between camps 1 and 2, Dec. 3rd 1935, *J. G. Myers* 5801 ; noted as a small riparian bush.

P. riparia *Pulle.*

The following collections from British Guiana agree well with the type collection, *Pulle* 154, in the Utrecht Herbarium : Mazaruni River, *Appun* 263 ; Upper Mazaruni River, 1863-1864, *Appun* 1702.

Distr. Surinam.

A well marked species on account of the small bracteoles and flowers, the glabrous anthers and gynoecium. There is a single large petal up to about 7·5 mm. long and 3 mm. wide, and 4 small petals of varying size from 1–3·5 mm. long and about 1 mm. wide.

P. guianensis *Aubl.*

In Enum. Pl. Surinam, p. 212, Pulle has a misleading note which suggests that there is a discrepancy between Aublet's figure of this species and his specimen at the British Museum. This is not so. The specimen which may with justification be taken as Aublet's type shows a flower with three long, subequal petals which accords with his figure. Other sheets from French Guiana in Herb. Mus. Brit., coll. *Rothery*, *Martin*, *van Rohr*, also exhibit flowers with 2–3 long narrow petals of more or less equal length. No gynoecium is present on Aublet's specimen, and only a single anther, which is glabrous. The large sepals are 1·6–1·8 cm. long and up to 7 mm. wide ; while the large spathulate-linear petals are 2·5–2·9 cm. long and 3–6 mm. wide.

P. brasiliensis *Ducke.*

This very distinct species is remarkable for its short filaments and style which are less than 2·5 cm. in length. In *Ducke* 10882 there are at least four petals over 1 cm. long, and they are conspicuously ciliate.

Hymenaea palustris *Ducke.*

Upper New River, Dec. 11th 1935, *J. G. Myers* 5868 ; " very tall riparian tree (from which I made bark canoe), 153 ft. high, first branch at 102 ft., girth at breast height 8 ft. 6 in." No. E of " Last Small Set," *Robert Schomburgk*, with note that bark canoes were made from the tree ; specimens in both Herb. Benth. (unidentified) and Herb. Hook. (identified as *Hymenaea* sp.).

Distr. Amazonian Brazil. Perhaps not more than a variety of *H. oblongifolia* Huber.

Licania cuprea *Sandwith*, sp. nov. ; inter species cymas secus inflorescentiae rhaches pedunculatas gerentes *L. densiflorae* Kleinhoonte affinis, foliis jam adultis subtus tomentosis, inflorescentiis gracilibus ramulis haud densifloris, bracteis bracteolisque angustis subulatis, lobis calycinis angustioribus statim distinguitur.

Arbor mediocris, ramulis summis dense fulvo-tomentosis, lenticellis in ligno vetere glabrescente tantum obviis. *Stipulae* persistentes, subulatae, 3·5–5 mm. longae. *Folia* lanceolata, oblongo-lanceolata, elliptica, vel oblonga, rarius subovata, apice attenuata acuta vel acuminata vel cuspidata, basi rotundata usque acuta, 4·5–12 cm. longa, 2–4·3 cm. lata, crasse coriacea, supra nitidula siccitate saepe nigrescentia costa pilosulo-pubescente excepta glabra costa nervisque impressis manifestis reticulatione sub lente tantum cernenda, subtus flavescenti-cinerea arcte arachnoideo-tomentosa nervis omnibus prominentibus rete venularum intricato venulis crassis inter tomentum persistens manifestis, nervis lateralibus primariis utroque costae latere 8–10 arcuato-ascendentibus ; petiolus 0·5–1 cm. longus, supra vix vel obscure tantum canaliculatus, indumento ramulorum. *Inflorescentiae* axillares et terminales, saepius e basi ipsa ramosae, graciles, vulgo 4–10 cm. longae, ubique pilis brevibus patulis flavo-brunneis vel brunneis dense tomentosae ; rhachis vulgo 1 mm. diametro vel gracilior ; rami pauci, ascendentes, basales ad 5 cm. longi, ceteri breviores nonnunquam bracteis foliaceis stipulisque subtenti ; bracteae basi pedunculorum angustae, lanceolato-subulatae, 1–1·75 mm. longae ; cymae conspicue pedunculatae, pedunculo 5 mm. longo, simpliciter 2–3-florae vel rarius dichotomae ; bracteae cymarum ceteris similes ; bracteolae prope medium pedicellum similes sed minores ; pedicelli ad 2·5 mm. longi. *Alabastra* colore pallide purpureo saepius suffusa, villosulo-lanato-tomentosa. *Calycis* tubus campanulatus, circiter 1·5 mm. longus atque 2·5–3 mm. diametro, intus tela araneosa albida praeditus ; lobi deltoideo-lanceolati usque subovati, obtusi, circiter 1·3–1·7 mm. longi, 1–1·2 mm. lati, intus griseo-tomentelli. *Petala* nulla. *Stamina* 3. *Ovarium* dense rufo-brunneo-villosulum ; stylus circiter 1·7–2 mm. longus, albo-pilosus. *Fructus* plus minusve subgloboso-pyriformis, 3–3·5 cm. longus, 2·5–3 cm. diametro, densissime molliter cupreo-fusco-tomentosus, haud costatus, basi in stipitem 1·5–2 cm. longum 3–5 mm. latum contractus.

BRITISH GUIANA. Demerara River, Dec. 1891, *Jenman* 6300 (typus floris). Western side of Berbice-Demerara watershed, on hill-top in Muri bush at heads of Paidaka and Mauri Creeks, fl. Nov. 6th 1919, *Hohenkerk* in *Forest Dept.* no. 801. Christianburg, Demerara River, fr. Feb. 14th 1910, *C. W. Anderson* in *Forest Dept.* no. 456. Moraballi Creek, Essequibo River, near Demerara-Essequibo watershed, fruit Sept. 18th 1935, *Davis* in *Forest Dept.* no. 2421 (typus fructus) : tree about 70 ft. high, 10 in. diam., on white sand in wallaba forest ; undersurface of leaves dirty

rusty-white; fruit densely covered with bright coppery-brown indumentum.

Vernacular names (Arawak): *Aruadanni, Muri Kautaballi* (fide C. W. Anderson); *Unikiakia* (fide Hohenkerk); *Kunoko* (fide Davis).

Very distinct among the British Guiana members of this critical genus, and not agreeing with the material or description of any known species, but the names of South American *Licaniae* will only be settled by monographic study and the assembling together of the very numerous types.

Turneraceae.

Turnera brasiliensis *Willd. ex Schultes.*

New River, between camps 10 and 11, Dec. 21st 1935, *J. G. Myers* 5896: slender undershrub in tall mixed rain forest; flowers with decided scent of heliotrope.

Distr. Amazonian Brazil.

The material agrees with the descriptions of Urban and with Brazilian specimens in all important respects, but the large leaves have strikingly long (up to 3 cm.) petioles, and the margins of the upper half of most of the laminae are conspicuously and irregularly dentate-serrate. The Brazilian material itself is variable, and it does not seem advisable to found a new variety upon the evidence of a single collection.

Cucurbitaceae.

Posadaea sphaerocarpa *Cogn.*

Amakura River, Dec. 1890, *Jenman* 6288. Yarikita Police Station, at junction of Yarikita and Amakura Rivers, Jan. 1920, *Hitchcock* 17604.

Distr. Cited only from Colombia by Cogniaux in Engl. Pflanzenreich, iv. 275. 1. p. 252 (1916), but the distribution can be extended as follows: Costa Rica; Aragon, Turrialba, Jan. 1899, *Pittier* 13211, distributed as *Sechium edule* Sw. (Kew!). Trinidad; Cunupia, near Mrs. Woodcock's, a vine with orange-like fruits, Jan. 1917, *Broadway* in *Herb. Trin.* no. 9430 (Herb. Trin.!).

Rubiaceae.

Ixora Davisii *Sandwith*, sp. nov.; ob reticulationem foliorum obsoletam haud cernendam, inflorescentias terminales sessiles contractas congestifloras, flores cymarum sessiles, corollas extra puberulas, praesertim bracteas cymarum bracteolasque florum pro genere magnas ovatas conspicue connatas notabilis.—? *Patabea coccinea* Aubl. Hist. Pl. Guiane, **3**, t. 43 (1775). ? *Cephaelis sessiliflora* Willd. Sp. Pl. **1**, 979 (1797).

Frutex altus vel arbor parva, ramulis glabris laevibus teretibus vel apicem versus leviter sulcatis. *Stipulae* vagina 2–3 mm. longa, aristis 0·75–4 mm. longis, extra glabrae, intus plus minusve pubescentes. *Folia* anguste elliptica usque ovato-oblonga, apice late

acute acuminata, basi obtusa vel acute cuneata, in petiolum decurrentia, 9·5–18·5 cm. longa, 4·8–7·5 cm. lata, coriacea, glabra, siccitate supra griseo-olivacea usque purpurascenti-nigrescentia, subtus pallide brunnea, costa supra plana subtus prominente, nervis lateralibus primariis utroque costae latere circiter 10, supra planis vel undulato-impressis, subtus tenuissime prominulis, nervis lateralibus intermediis vix cernendis, reticulatione omnino impressa neque cernenda sed pagina utraque crebre verruculoso-rugulosa ; petiolus circiter 1·3–1·5 cm. longus. *Inflorescentiae* terminales, sessiles, thyrsoideae, vulgo arcte congestiflorae, circiter 2 cm. longae, ad 4 cm. latae, ramulis primariis ad 1 cm. longis sed saepe brevissimis, ubique puberulae ; bracteae omnes pro genere latae, insigniter plus minusve connatae, ultimae sub cymis ovatae, obtusae, nonnunquam brevissime cuspidatulae, usque trientem inferiorem vel medium connatae, 3–4 mm. longae, 3·5–5 mm. latae, calyces amplectentes, extra puberulae atque ciliolatae, intus adpresse sericeo-pubescentes ; bracteolae similes sed aliquantum minores, indumento simili, alte connatae, calycem arcte amplectentes atque fere aequantes. *Flores* cymarum sessiles, alabastris solemniter rubris. *Calyx* campanulatus, circiter 3 mm. longus atque latus, extra furfuraceo-puberulus, intus adpresse sericeo-pubescens, lobis late breviter deltoideo-triangularibus ad 0·5 mm. longis 1·5–2·2 mm. latis. *Corolla* tubo solemniter rubro 9·5 mm. longo, circiter 1·3 mm. diametro, extra furfuraceo-puberulo, intus glabro ; lobi intus albi, valde contorti, deltoideo-lanceolati, acuti, 6–7 mm. longi, ad 3 mm. lati, extra sparse puberuli vel glabrescentes, intus plus minusve glabri. *Antherae* sessiles, oblongae, apiculatae, 2·6 mm. longae. *Ovarium* circiter 1 mm. longum ; stylus glaber, 11 mm. longus, stigmatibus glabris circiter 1·2 mm. longis. *Fructus* subglobosus, ad 9 mm. longus, circiter 8 mm. diametro, inferne glabratus, superne apicem versus puberulus, basi bracteis bracteolisque persistentibus cinctus, apice calycis reliquiis ad 1·5 mm. longis vix 2·5 mm. latis coronatus.

British Guiana. Upper Demerara River, about 110 m. S. of Georgetown, alt. 100 ft., Oct. 15th 1935, *Davis* in *Forest Dept.* no. 2457 : stout bushy undergrowth shrub, about 7 ft. high, growing in Mora forest near a creek on clay soil ; inflorescence and calyx dark red-brown ; buds deep red ; corolla tube deep red, lobes milk-white within.

A very distinct plant, not obviously related to any known species of *Ixora*, but probably to be placed near the Guiana *I. graciliflora* Bth., *I. surinamensis* Brem, and *I. Versteegii* Brem., or the Brazilian *I. Spruceana* Muell. Arg. Comparison with the figure of Aublet's *Patabea coccinea* immediately suggested a resemblance which is confirmed by examination of the type specimen in Herb. Mus. Brit. The leaves, stipules and inflorescence all agree in general characters and facies, but the secondary lateral nerves and a certain amount of loose open reticulation are apparent (although extremely fine) on the lower surface of Aublet's leaves, as in his figure. Aublet's

inflorescence is young and no dissection can be made; there are certain discrepancies between his description and that of *I. Davisii*, e.g. the shape of the calyx lobes and bracts (the latter, indeed, look much more acute in Aublet's plant than in the British Guiana material); but there seems to be little doubt that *I. Davisii* must be very closely related to, if not conspecific with, *Patabea coccinea*. The possibility of such an identification for Aublet's genus *Patabea* is of much interest in view of the fact that all French botanists, Willdenow, De Candolle, Kunth, Bentham and Hooker, and Schumann, have invariably referred it to the *Psychotrieae*, and have allied or reduced it to *Psychotria* or *Cephaëlis*. Both Aublet's trivial *coccinea* and the later trivial *sessiliflora*, with which Willdenow renamed the plant when he placed it in *Cephaëlis*, are preoccupied in *Ixora*.

APOCYNACEAE.

Geissospermum sericeum *Miers*.

Malali Rapid, Demerara River, about 85 m. S. of Georgetown, Oct. 4th 1935, *Davis* in *Forest Dept.* no. 2444: tree over 100 ft. high, about 20 in. diam., in mixed forest (burnt) among concretionary ironstone boulders on gravelly soil; bark yellowish-brown, furrowed; bole fluted, with window-like slits; leaves whitish below; flowers whitish within, corolla with silky-brown indumentum without like the calyx and branchlets.

Vernacular name (Arawak), *Manyokinaballi*.

Distr. Surinam, French Guiana, Amazonian Brazil and Bolivia. The first record from British Guiana.

CONVOLVULACEAE.

Jacquemontia ciliata *Sandwith* in Kew Bull. 1930, 156.

In Indian provision field, Karinyi, Upper Essequibo River, Nov. 26th 1935, *J. G. Myers* 5751.

Distr. Trinidad, Colombia (*Lawrance* 110, distributed as *J. pentantha*) and Costa Rica.

SOLANACEAE.

Solanum sacupanense *Rusby*.

BRITISH GUIANA: Upper Essequibo River, between Onoro and Karinyi, Nov. 24th 1935, *J. G. Myers* 5734: "suffruticose plant forming pure societies at water's edge along low stretches of bank." Without locality, 113 S, *Robert Schomburgk*. Essequibo River, Sept.-Oct. 1881, *Jenman* 1125. Mazaruni River, Sept. 1880, *Jenman* 778. Cuyuni River, common along banks and growing in water, fls. white, Oct. 1904, *Bartlett* in *Jenman Herb.* 8253.

BRAZIL: Rio Branco, bank near San Marcos, Jan. 1909, *Ule* 7830: 1–3 ft. high, fls. white.

VENEZUELA: Sacupana, Lower Orinoco, April 1896, *Rusby and Squires* 22 (type no.).

This has been confused with *S. heterophyllum* Lam., which has larger flowers with much longer anthers, and a very different calyx with shorter and broader, less subulate, teeth. *S. sacupanense* evidently varies in the strength of its armature, and may have more lobed leaves than in the type collection.

MYRISTICACEAE.

Virola venosa (*Bth.*) *Warburg* sens. *van Ooststroom.*

Near Itaburro Creek, Demerara River, about 130 m. S. of Georgetown, fl. Nov. 2nd 1935, *Davis* in *Forest Dept.* no. 2478 : tree about 120 ft. high and 20 in. diam., very slightly buttressed, in mixed forest on brown sand soil ; latex red ; inflorescences and flowers pale yellow. François Creek, Mahaicony River, Demerara Co., fr. March 23rd 1934, *Davis* in *Forest Dept.* no. 2363 : unbuttressed tree, about 105 ft. high, in mixed forest on brown sand ; fruits brown ; fleshy aril bright red ; seed pale ashy-brown.

Vernacular name (Arawak), *Hill Dalli* (*Dalli* is *V. surinamensis* (Rol. ex Rottb.) Warb.).

Distr. Guiana, Amazonian Brazil and Peru.

XVI—THE RACES OF SORGHUM.* I. H. BURKILL.

The opportunity of reviewing Snowden's valuable book is an invitation to frame from his materials the history of *Sorghum* in cultivation. The data are all present, but he has not developed his subject from this angle.

The plants he deals with do not occur in a wild state, and their history is thus intimately associated with that of man. They furnish a source of grain, which is eaten sometimes slightly immature, usually fully mature, either parched or boiled, or, after grinding, as a gruel, porridge, or unleavened (rarely leavened) bread. The grain of inferior varieties man may feed to his domestic animals, and he himself is able to fall back on it in times of scarcity ; or he may ferment it to provide a beverage. His cattle are fed on the straw ; and the stems of those which contain sugar he may use for chewing. Dry stems that are not sweet can be used for building houses and shelters and in other similar ways ; and there are kinds with special uses such as the making of brooms : some are grown for the red dye that they produce. In European hands certain sweet kinds have been grown for making syrup and sugar. The uses may be mutually exclusive ; thus, for example, if the red dye be plentiful the grain is of little value : and man, unable to secure all his requirements from a single variety, has selected his sorghums according to his needs and grows them side by side. This is a fact which has complicated the history of the crops.

* "The Cultivated Races of Sorghum" by J. D. Snowden, printed for the Trustees of the Bentham-Moxon Fund, London, 1936: pp. viii+274, 8vo., price 10*s.* 6*d.*

Asia, having rice as a cereal and the sugarcane as a source of sugar, has accepted sorghum as a supplementary food crop, its value lying in its drought-resistant qualities. In the same way America, which is largely dependent on maize as a cereal, has developed the sorghum crop only in areas where the climate is too dry for maize. Africa, on the other hand, with its precarious system of shifting cultivation, has felt an intense need for drought-resistant cereals and has brought the oldest types, but by no means all the cultivated sorghums, into being.

Snowden enumerates 31 species, embodying 157 varieties which contain 571 forms. None of his varietal names is repeated, so that, should another botanist decide to unite certain species, the varietal names need suffer no disturbance. The method displayed is worthy of all praise: step by step he catalogues his material, giving each species its characters and affinities and illustrating each with figures which show the same parts drawn to a constant scale. At the end of each description he summarises the uses and cultural requirements. He almost apologises for calling them species, i.e., for adopting a very narrow specific standard, but he is entitled to do so and is consistent throughout.

He accepts the opinion that the cultivated sorghums are polyphyletic in origin, some having been derived from *S. arundinaceum*, some from *S. aethiopicum*, some from *S. verticilliflorum*, and some possibly from *S. sudanense*. He rounds off his work by an account of these wild species and their closest allies. The 31 cultigens (species) he groups into six "subseries," linking them (p. 239) with their presumed wild parents.

The collection of sorghums on which Snowden's work has been based consists of more than 3000 specimens, which have been brought together at Kew by a triumph of co-operation between the Royal Botanic Gardens and the Agricultural Departments of the Colonies and the Union of S. Africa. The sorghum-growing regions of Africa and Asia have all contributed to this collection and what is available in other herbaria has been examined. Using Snowden's varieties as units, the writer of these pages, satisfied that the book furnishes an excellent basis for a phytogeographical and ethnobotanical outline, has analysed it in various ways. He finds the distribution of these to be as follows: India proper, with Ceylon, 43; Tanganyika Territory 40; Anglo-Egyptian Sudan 37; Africa, north of the Gulf of Guinea, 27; Equatorial west Africa 22; the "Horn of Africa" 21; Rhodesia 18; Nyasaland 14; Egypt 12; Uganda and Kenya 11; Transvaal, Natal, Basutoland and Zululand 11; Arabia 10; Burma 10; China and Korea 8; Angola and South West Africa 8; Iraq, Persia and Afghanistan 5; Portuguese East Africa 4; Malaysia 4; the Cape Colony 3. It is probable that India stands too high in this list and that Portuguese East Africa is too low, but the impression given of the relative importance of sorghum in the different units of land is broadly true. Inasmuch as India

originally received sorghum from Africa, its high place in the list is unusually interesting. The Indian distribution of varieties is as follows : Deccan Plateau 21 (excluding recent introductions) ; the north-west of India 17 ; Coromandelia 14 ; Central Provinces 13 ; eastern Gangetic Plain and adjoining hills 11 ; and Malabaria 7.

With very few exceptions the cultivated sorghums are grown with the aid of less than 40 inches of rain. These exceptions are practically confined to a limited area in the extreme west of Africa which lies between Cape Verde and Cape Three-Points. Here the rainy season lasts for 6–7 months. For this area *S. margaritiferum* has been evolved—a small-grained variety useful for human food. *S. gambicum* is also grown in this region, its grain being mainly used for feeding stock and for making beer. Behind this area and the coastal fringe of evergreen forest, which extends east and west of the Niger delta, is drier country with a shorter and more erratic rainfall ; over it the main grain sorghum is *S. guineënse*, supplemented by *S. exsertum*. Here also is found *S. mellitum*, a species which has sweet stems used for chewing. Snowden considers that all these five species are derived from *S. arundinaceum* and in this parentage their fitness for the climate would originate. None of the four species which are definitely grown as grain-crops extends eastwards beyond the Nile valley ; and therefore there has been no free opportunity for their transport to Asia.

As the country becomes still drier towards the northern limits of Nigeria a transition zone is entered ; and the following are recorded as being cultivated there : (i) of those species already mentioned, *S. margaritiferum*, 1 variety ; *S. guineënse*, 5 varieties ; *S. mellitum*, 1 variety ; *S. exsertum*, 2 varieties ; (ii) of others intruding from the east : *S. membranaceum*, *S. notabile*, *S. nigricans* and *S. durra*, each in 1 variety, and *S. caudatum*, 3 varieties. In this area *S. caudatum* is the most important cereal grain ; it is also grown extensively around Lake Victoria, from where it extends northwards along the Nile valley as far as Khartoum, as well as southwards into Tanganyika Territory. Its cultivation has never extended, however, as far as the eastern seaboard, and it has never been conveyed to India by Arab or other Asiatic agency.

Turning to the sorghums of the South, *S. caffrorum* is everywhere grown south of Latitude 5° S. as a cereal crop ; while European farmers have extended as fodder crops the cultivation of certain varieties of this species which possess sweet stems. For various reasons it is suspected that this species has not had such intelligent selection as have had the sorghums grown north of the equator. At any rate it has not been so ennobled as to close the door to the drifting in of superior varieties, such as *S. basutorum*, nor to exclude the use towards the north of *S. simulans* as a beer-crop and for chewing.

The evergreen forests of the Congo basin with their heavy rainfall and high humidity effectively separate the sorghums of West Africa from those of the south ; and this part of the continent

apparently has not evolved any sorghums : its forests stretch from the west coast almost as far east as the Rift valley. There is another, though less-pronounced, area of higher rainfall on the east coast within which is the hinterland of Zanzibar, where hilly country causes the Trade Winds from the Indian Ocean to deposit their moisture. This area has evolved its own type of sorghum, *S. elegans*, in adaptation to its higher rainfall. Between it and the evergreen forests of the Congo there is drier country in which the fully interfertile species of the south and the north can meet, and this drier country seems to constitute a melting pot and recasting factory where immigrants lose their identity and selection has new forms to draw upon. Apparently none of the southern types has passed intact northwards through it, nor have any of the northern types passed southwards. Thus there is a complete barrier right across Africa. This barrier limits the Rhodesian varieties. For instance Snowden enumerates 18 (belonging to 5 species) : of them, 11 also occur in Tanganyika, 6 in Nyasaland and 6 in the Belgian Congo, but none of the varieties representing 4 of these species (*S. conspicuum*, *S. Roxburghii*, *S. coriaceum* and *S. caffrorum*) occurs north of the equator, though varieties of the fifth species do so. This fifth species, which is *S. nigricans*, differs from the other four in its principal use being for making beer, having dark-coloured, bitter grain which renders it unattractive as a source of flour. It is suggested that a tendency exists for crops which administer to pleasures to be dispersed rather more freely than ordinary food crops. Another example of this is the wider distribution range of some of the sweet-stemmed forms which are used for chewing.

The north-eastern parts of the heart of Africa, according to Snowden's data, are a centre in which numerous varieties have arisen. He enumerates 38 as occurring in the Anglo-Egyptian Sudan. Of these, 5 extend as far west as Nigeria, 12 to Eritrea or Abyssinia or both, and 7 to Egypt, though some only as recent immigrants. The 3 important species are *S. caudatum*, *S. durra* and *S. subglabrescens*, none of which plays a part in the agriculture of the wetter parts of west Africa, nor in the remoter south. The same three species are represented towards the dry " Horn of East Africa " (Eritrea, Abyssinia and Somaliland) in 16 varieties and it is remarkable that only three others have been recorded there which are derived from different species.

Besides these three species, *S. melaleucum* and *S. rigidum* serve as luxury crops yielding a superior quality of flour. *S. rigidum* must have been selected from the ancestry of *S. durra* and *S. subglabrescens* ; but *S. melaleucum* is allied to *S. nervosum* and will be referred to later. A third associate is *S. notabile* which, unlike the other two, extends into Nigeria. The only reason which suggests itself for this migration is that the grain is said to keep better when stored—a valuable asset in a country liable to famine.

There is no evidence to show that any variety of sorghum originated in Egypt, nor are there any certain indications that the

crop was grown there in early Egyptian times, although commercial communication existed both up the Nile and down the Red Sea. The Romans would surely have recorded its occurrence if it had been grown in the time of the Caesars ; and it is possible, though there is no actual evidence, that its introduction dates from the time of the Arab conquest in A.D. 641. It would seem that the crop was introduced from the Upper Nile area, and that varieties of *S. durra* were the first to be grown. It is noteworthy that varieties of *S. subglabrescens* have not reached Egypt. Though this species has a common ancestry with *S. durra*, it appears to have originated eastward of the grazing lands of Abyssinia and would thus have been inaccessible by the Nile route to Egypt. It also appears to have been evolved at a later date than *S. durra* ; for whereas the latter has spread through Egypt, Palestine, Arabia, Persia and India, *S. subglabrescens* is known only outside Africa in Arabia and southern India, i.e., along the maritime trade routes from east Africa. It is reasonable, therefore, to presume that *S. subglabrescens*, by being evolved at a later date than *S. durra*, missed the opportunities for expansion which the latter gained.

Snowden recognises sixteen varieties of *S. durra*. These are distributed as follows : Sudan 9 ; Hindustan 7 ; Egypt 6 ; Eritrea and Somaliland 5 ; the Deccan 4 ; Arabia 3 ; Baluchistan 3 ; the Central Provinces of India 2 ; Coromandelia 2 ; Malabaria 2 ; Afghanistan 1 ; Nigeria 1 ; and in European gardens 1. Seven varieties are confined to Africa and six to Asia, of which three are unknown outside India, while the variety *javanicum* is also probably of Indian origin. Allowing for the time factor in the evolution of these distinctive asiatic varieties one can assume that *S. durra* reached India by the sea route and not by way of Egypt and Arabia.

Furthermore, this assumption is strengthened on observing that India seems to have evolved the species *S. cernuum* out of *S. durra*. Snowden recognises seven varieties of *S. cernuum*, all of which occur in India. Five of these are common crops in the Central Provinces where the centre of this evolution appears to have been. One variety is found in Afghanistan, one in Persia, two in southern Arabia, two in Palestine, and one in the gardens of the curious in Europe since the sixteenth century. It would thus appear that this species filtered through to Europe from India. It has also extended eastwards into Burma where two varieties are recorded.

There appear, however, to have been earlier waves of introduction to Asia than the *S. durra* invasion. These carried the two species *S. dochna* and *S. bicolor* of the subseries *Bicoloria* on the one hand, and the ancestry of the Chinese sorghum, *S. nervosum*, on the other. Both waves led to a wider and more varied dispersal than *S. durra* has, and to the origin of new species in Asia. But in India the more hardy and close-headed grain varieties of *S. durra* seem subsequently to have usurped a supremacy over the vast black cotton soil tracts of India and to have driven the earlier loose-headed inferior-grained

varieties onto the more scattered and less fertile red soils, whereupon species-fragmentation followed. This fragmentation gave rise, *inter alia*, to *S. miliiforme*—a species centred in north-eastern India which is not pre-eminently a sorghum area, as the climate is humid and the rainfall is comparatively heavy—by a process of selection directed to adapting it to special climatic conditions. A parallel case is, perhaps, the evolution of *S. elegans* in the Zanzibar hinterland.

S. splendidum would seem to have arisen by crossing one of the species of the *Bicoloria* subseries with a forerunner of *S. nervosum*. Here again is an example of a species arising to fulfil certain requirements. In this case these are human. It arose in the Indo-Chinese phytogeographic Subregions where a glutinous cereal is in much demand, to supplement, one assumes, the supply of glutinous rice. The species occurs in Burma, Siam and various parts of Malaysia, extending as far east as the Philippines.

Snowden considers that the sorghum which Pliny tells us reached Italy from India in his time was a form of *S. bicolor*; but one asks whether *S. bicolor* and *S. dochna* were already distinct species? It is clear that Pliny regarded it as a cereal grain. We lose sight of sorghum in Italy from his time till A.D. 1305, when Petrus de Crescentiis tells us that it had there a variety of uses—its stems for the walls of temporary shelters and other purposes, its grain for feeding to animals and as a human food in times of scarcity. Almost three hundred years later, the Italian physician, Mattioli, claimed to recognise Pliny's plant in one familiar to himself, though with more faith than evidence. Yet it can be assumed reasonably enough that the cultivation of sorghum in Italy was continuous from Pliny's time to the middle ages. It is extremely probable that Pliny's plant was one with a loose panicle: in support of this assumption, it would seem that the varieties *corymbosum* and *technicum* of *S. dochna*, now known as "broom corns," originated in the Mediterranean Region. The Florence whisk and Venetian whisk are early names for the manufactured products obtained from the tough, lengthened axes of the panicles of these two varieties.

Apart from this development of *S. dochna* in the Mediterranean Region, it is desirable to see whether it is possible to ascertain how the *dochna-bicolor* ancestry fragmented. The problem is complicated by the wide dispersion of varieties of these species by comparatively recent European agency. *S. bicolor* var. *Arduini* was one of the sorghums assembled by the elder Arduini in Italy in the eighteenth century, who probably discovered it in Europe. *S. bicolor* is represented in Burma by two varieties, though neither is confined to this region, one of them extending to China, Japan, and the Hawaiian Islands. The variety *bicolor* is extensively grown in Khorasan and occurs in many unexpected places through India and China. Though Snowden records as in Africa one variety of *S. bicolor* and one of *S. dochna*, no definite indication is given thereby

that that Continent is the ancestral home of these far flung species: there is indeed little indication in any of the varieties which does so: thus we are left with the two alternatives—has the *dochna-bicolor* ancestry lost its hold on its original home in Africa, or did it originate outside Africa? If the first alternative be deemed acceptable, then one must point to *S. elegans*, which is now grown on the mainland behind Zanzibar, i.e., rather far south for the earliest traders, as the nearest living line.

S. Roxburghii is another loose-panicled sorghum whose migration is of interest. This is the only species of the subseries *Guineënsia* which has travelled right across the continent of Africa and from there has found its way to Asia. Its distribution in the Indian Empire is similar to that of *S. dochna* and *S. bicolor*, but it is more frequently grown than either and in some of its varieties is an excellent cereal. Of its eight varieties, four are entirely African and two are entirely Asiatic; the other two occur here and there around the Indian Ocean. These last seem in some ways to be of Indian origin, but Snowden writes (p. 67) of them as if they were losing ground in Tanganyika Territory. The variety *hians* occurs in several forms both in Zanzibar and on the mainland, though it would seem to be an Indian variety, and var. *fulvum* occurs as a coastal variety from Siam and both sides of the Bay of Bengal to Madagacsar, the Comoro Islands and the East African coast. The four African varieties clearly belong to that continent and are found principally in the neighbourhood of the big lakes and rivers adjoining Nyasaland and Tanganyika, as if the extra atmospheric humidity was necessary for this species.

The last place in this survey has been reserved for the subseries *Nervosa*, because its principal species—*S. nervosum*—is, in the main, Chinese and thus furthest removed from the country of the origin of the cultivated sorghums. It and its allies, like the far flung *dochna-bicolor* ancestry, supply a case of fragmentation and presumably therefore of early transportation from Africa to Asia. The allies of *S. nervosum* are *S. membranaceum*, *S. basutorum*, *S. melaleucum*, *S. ankolib* and *S. splendidum*. *S. basutorum* is a superior grain species of South Africa; and for similar reasons *S. melaleucum* is a luxury crop in the Sudan. *S. spendidum* has a glutinous grain and occurs in the Indo-Chinese Sub-regions, while *S. ankolib* is confined to north-east Africa where it is esteemed for its sweet stems and its grain is used for making beer. *S. membranaceum* links the others together geographically. It stretches south to the Transvaal, northwards to the Sudan and the "Horn of Africa" and reaches India in three varieties, while one extends to north China. It is from this last extension that in all probability *S. nervosum* originated, but, if so, it is to be noted that the character of sweet stems, common to the species of this subseries, has been lost.

It would appear that there have been at least two invasions of this subseries into Asia, one of which would seem to be of comparatively

recent date ; for the three varieties of *S. membranaceum* which occur in Bombay and the Central Provinces of India are also recorded from north-eastern Africa. That successive transfers were possible and indeed probable is shown in historical records. The Sabaeans were trading in 300 B.C. to India beyond the Ichthyophagi from below the Horn on the African coast, and they were succeeded by other traders. Chinese records show that subjects of the Roman emperor Marcus Aurelius Antoninus arrived on her shores in A.D. 166. By A.D. 300 the Chinese themselves had voyaged to the shores of Arabia, while ship-building had developed to such an extent that a prince of Tanjore could send a navy to Burma ; and in A.D. 414 the pilgrim Fa-hien sailed from Ceylon to Java in a ship large enough to carry 200 men. It is certain that grain of whatever kind might be available would be shipped at every port of call where this was feasible, and its acceptance for cultivation in a new country would depend on the climate of that coast and the need. Moreover sorghum is not the only crop which would seem to have been carried by sea at a remote time between Asia and Africa. *Sesamum orientale*, judging by the diversified forms which are found in India, Burma and the Far East, may have been transported from Africa at a very early date ; and a closer study of other crops such as the grain pennisetums, *Eleusine coracana*, *Cajanus cajan* and *Vigna unguiculata* (V. sinensis), all of which occur in cultivation both in Africa and Asia, may expose a comparable history of transportation.

The order therefore in which sorghums reached Asia would appear to have been somewhat as follows. The original stock which spread through Asia was that of the *dochna-bicolor* subseries. This was followed by some of the stock of the subseries *Nervosa*. At a considerably later date this was followed by the stock of *S. durra* and more recently still by *S. subglabrescens*. Probably *S. Roxburghii*, which, as belonging to the West African subseries *Guineënsia*, would require time to cross the African continent so as to reach the east coast for shipment, was the last to be transported.

Even as late as the nineteenth century, Indian immigrants to the Mascarene Islands and the African coast, have apparently made some interchange of sorghums. Light on this and on many other points has yet to be discovered by local study. Snowden's book supplies the foundations on which we may hope to build.

XVII—A NEW COTONEASTER FROM TIBET.

C. V. B. Marquand.

Cotoneaster conspicua *Comber* in Gard. Chron. ser. 3, **99,** 388 (1936), anglice ; affinis *C. microphyllae* Wall., a qua foliis elliptico-oblongis, eis ramulorum hornotinorum ad 9 mm. longis et 3·5 mm. latis, eis annotinorum ad 2 cm. longis et 8 mm. latis, fructu majore differt.—*Cotoneaster conspicua* in Journ. Roy. Hort. Soc. **59,** 303 (1934) *nomen.*

A small, spreading *shrub*. *Branches* greyish brown, verrucose. *Branchlets* patulous, at first densely whitish villous, later becoming glabrescent. *Leaves* on the flowering branchlets elliptic-oblong, 6–9 mm. long, 2–3 mm. wide, margin recurved; upper surface sparsely pubescent when young, becoming glabrous and ± shining in the fruiting stage; lower surface densely appressed-hirsute, in a young state, more sparingly so when mature; midrib impressed above, nerves inconspicuous; petiole 1.5 mm. long, villous; leaves on the barren branchlets similar but larger, up to 2 cm. long and 8 mm. wide. *Stipules* persistent, subulate, scarcely 2 mm. long. *Flowers* solitary, terminating numerous very short spurs on the lateral branchlets. *Receptacle* 3 mm. in diameter, sparsely tomentose outside. *Sepals* triangular, acute, 1·5 mm. long, 1·5 mm. wide, densely appressed-villous. *Petals* widespreading, with a suborbicular blade, 3 mm. long, 4 mm. wide, white, tipped with pink in the bud. *Stamens* 20; filaments subequal, yellowish; anthers subglobose, purple. *Styles* 2, 3 mm. long. *Carpels* 2, glabrous. *Fruit* obovoid or globose, 9 mm. long, 8 mm. in diameter, scarlet (carmine red in dried specimen) with a dull surface; sepals suberect in the fruiting stage. *Pedicel* 1·5 mm. long, pubescent. *Pyrenes* 2, glabrous.

Tibet. Gyala, 2400-2700 m., November 15, 1924 *F. Kingdon Ward* 6400.

This species was raised by Mr. James Comber from seeds collected by Captain Kingdon Ward in Tibet in 1924. It was exhibited at the Royal Horticultural Society by Lt.-Col. L. C. R. Messel, O.B.E. of Handcross, Sussex, receiving an Award of Merit on October 10, 1933, under the then unpublished name *Cotoneaster conspicua*. The first description of the species was published in June 1936 by Mr. James Comber (l.c.).

No wild specimens being available, the technical description given above is based on cultivated material kindly sent by Mr. Paul Russell of the Bureau of Plant Industry, United States Department of Agriculture, Washington. Mr. Russell states that the plant was raised from seed collected under the above field number by Captain F. Kingdon Ward, who records the following particulars in his published Field Notes, p. 54:—"Shrub, either prostrate on rocks, or erect, up to 3–4 ft. Profusely covered with scarlet berries in winter. Open sunny situations amongst rocks, etc., in the moderately dry regions."

XVIII—MISCELLANEOUS NOTES.

New Year Honours.—We have much pleasure in recording the conferment of the following Honours:—

K.C.M.G.—Mr. F. A. Stockdale, C.M.G., C.B.E., M.A., Agricultural Adviser to the Secretary of State for the Colonies; C.I.E.—Mr. C. G. Trevor, Inspector General of Forests, Indian Forest Service, and Rao Bahadur I.S. Venkataraman, Imperial

Sugarcane Expert, Coimbatore; O.B.E.—Mr. R. H. Locke, Superintendent of Horticultural Operations, New Delhi, and Dr. G. H. Pethybridge, Ph.D., M.A., F.L.S., lately Mycologist and Assistant Director, Plant Pathology Department, Harpenden.

Mrs. Bolus.—We record with pleasure the conferment of the Honorary Degree of Doctor of Science by the University of Cape Town on Mrs. F. Bolus, Curator of the Bolus Herbarium, Kirstenbosch.

Mr. R. A. Dyer.—We learn with pleasure that Mr. R. A. Dyer, Botanist in the Division of Plant Industry, Department of Agriculture, Pretoria, and recently Botanist for South Africa at the Royal Botanic Gardens, Kew, has been awarded the Degree of Doctor of Science at the University of South Africa.

Arthur Reginald Horwood.—Members of the staff of the Royal Botanic Gardens, Kew, were deeply grieved to hear of the death of their colleague Mr. A. R. Horwood, F.L.S., on 21 February, at his home at Brentford. He had occupied the position of Temporary Botanist since 1 September 1924 and had worked continuously from that date in the European and Oriental Department of the Herbarium. The interment was at Scraptoft Cemetery, Leicester, on 25 February 1937.

Horwood was born at Leicester on 29 May 1879, the son of the late Rev. F. E. Horwood, M.A., Rector of South Croxton. He was educated at St. John's School, Leatherhead, and by private tutors, with the intention of entering the Indian Civil Service, for which however, he failed to pass the medical examination. For a short time he acted as private tutor and army coach. In 1902 he was appointed to a post at the Leicester Museum and was employed there (apart from home service in Cheshire regiments during the war) till he resigned the Sub-Curatorship in 1922. His work at the Leicester Museum was much appreciated by his chief and others concerned with the development of this well-known provincial museum. During his employment there he published a large number of books and papers on a wide range of botanical subjects, especially on palaeobotany and the British Flora. The best known of these are " Plant Life in the British Isles " (3 vols, 1914–16), " Practical Field Botany " (1914), and " The Outdoor Botanist " (1920).

At Kew, Horwood was mainly employed on the identification of the numerous European and Oriental collections and on rearranging genera of the *Compositae* and other families. In his private time he did a great deal of very diverse journalistic work and also edited the late Dr. J. B. Hurry's book " The Woad Plant " (1930). His most important publication was " The Flora of Leicestershire and Rutland," with the late (3rd) Earl of Gainsborough (1933). This volume of 687 pages contains interesting features new to a county flora.

Horwood made large collections of British plants, some of which are now preserved in the National Museum of Wales, the Leicester Museum, and the Herbarium at Kew. He was of a kindly and generous disposition, but rather determined to do his work according to his own methods which were not always in accord with wider interests. He was extremely industrious and worked very hard in his individualistic way. His correspondence was large and he will be much missed by numerous friends to whom he gave unstinted help and advice. He was twice married and leaves a widow and four sons.—W. B. Turrill.

Marshall Avery Howe.—We record with great regret the death on December 24th of Dr. Marshall A. Howe, Ph.D., D.Sc., Director-in-Chief of the New York Botanical Garden. Dr. Howe had been associated with the New York Garden for many years; he joined the scientific staff in 1901 and became Assistant Director in 1923. He succeeded Dr. Merrill as Director on October 1st, 1935.

Dr. Howe was born in Vermont and, having received his training at the University of that State, he held successively the posts of Instructor in Cryptogamic Botany of the University of California (1891–96) and Curator of the Herbarium at Columbia University (1899–1901). His main botanical work concerned the marine algae, of which he was the acknowledged authority in America for many years. He published a large number of floristic papers on the seaweeds of different parts of both North and South America, and specialized on the *Siphoniae* and lime-secreting algae of coral-reefs. He also published many purely systematic works. He was fond of collecting and was appointed a member of the scientific expeditions to Newfoundland, the West Indies and Panama, in the last two of which he was able to study the coral-forming algae in their natural habitats; one result of his investigations was to show that plants played a more important part in reef building than was previously thought.

Horticulture was also a subject of great interest to Marshall Howe. Amongst other groups he had expert knowledge of dahlias, irises and peonies. He took a great interest in the Bronx Park Garden and was President or Vice-President of several horticultural societies. Formerly a President of the New York Academy of Science, he was also President of the Torrey Botanical Club and was for a time editor of "Torreya."

Marshall Howe was a welcome visitor to Kew on several occasions before 1914, and was always ready to assist with critical knowledge and to give help in revising the American algal collections in the Herbarium. Owing to the care and well-balanced judgment which he brought to bear on all his investigations he has left to posterity a large amount of sound published work on the biology and taxonomy of marine algae.

Botanical Magazine.—The first part of vol. 160 was published on February 12th and contains the following plant portraits :—*Corylus colurna* Linn. (t.9469), the Constantinople Hazel, which occurs from S. Hungary to Trans-caspia ; *Chasmanthe caffra* (Baker) N. E. Brown (t.9470), a native of S. E. Cape Province and Natal ; *Grindelia chiloënsis* (Cornelissen) Cabrera (t.9471), from the Argentine ; *Saurauia subspinosa* Anth. (t.9472), from N. E. Upper Burma ; *Nierembergia caerulea* Gillies ex Miers (t.9473), formerly known under the name *N. hippomanica*, a native of the Argentine ; *Galanthus ikariae* Baker (t.9474), from the island of Ikaria in the Eastern Aegean ; *Rhododendron Weyrichii* Maxim. (t.9475), from southern Japan and Quelpaert Island ; *Anemone rupicola* Cambess. (t.9476), which is found from Chitral to N. W. Yunnan and Szechwan ; *Epidendrum coriifolium* Lindley (t. 9477), found from Guatemala to Peru ; *Cotoneaster Cooperi* Marquand var. *microcarpa* Marquand (t. 9478), a native of Bhutan, and *Carmichaelia odorata* Colenso (t. 9479), from New Zealand.

Boissiera.*—A supplement to the well known periodical " Candollea " has appeared. The title " Boissiera " is very apt, commemorating as it does the eminent Genevese traveller and botanist Pierre Edmond Boissier (1810–85), the author of " Flora Orientalis." The periodical of which " Boissiera " is a supplement also bears a personal title commemorating four generations of Genevese botanists —Augustin Pyramus de Candolle (1778–1841), Alphonse (1806–93), Casimir (1836–1918) and Augustin (1868–1920), whose fame and works are too well known to need any elaboration here.

Fascicle I of " Boissiera " is the first of a series of memoirs consisting of papers that for one reason or another cannot be published in " Candollea." They will form an independent series and will appear at irregular intervals. It is very appropriate that this first fascicle should be devoted to the posthumous work of yet another eminent Genevese botanist, namely " Les caractères de la dissymétrie et de l'hétérophyllie foliolaires chez les Méliacées à feuilles composées," by John Briquet.

We learn from the introduction by Professor B. P. G. Hochreutiner that Briquet was always interested in the question of symmetry ; he started his observations many years ago but, owing to other more pressing demands on his time, he was unable to complete this manuscript. He was continually making fresh observations on the subject, but unfortunately never found time to record his general conclusions on the systematic and phylogenetic value of leaf asymmetry. A chapter is devoted to an historical account of the *Meliaceae* with compound leaves. This is followed by a study of the species, dealing specially with leaf morphology. The leaves are

* " Boissiera." Mémoires du Conservatoire de Botanique et de l'Institut de Botanique Systématique de l'Université de Genève (Supplément de Candollea). Fascicule I. Genève, 1936. Institut de Botanique Systématique de l'Université.

described in great detail and a fund of information is included; therein lies the great value of this unfinished work. It certainly forms an important adjunct to the study of the *Meliaceae* given in De Candolle's Monograph, and as Professor Bugnon remarks (preface, p. 3) it represents not only a complement to the Monograph of *Meliaceae*, but it is a model for monographic study of other families of plants with compound leaves.

In going through the work the reader is impressed by the wealth of detailed observation and careful measurements. This paper is yet another proof of the remarkably versatile mind of the late John Briquet, which is so clearly seen if one glances through the list of his works given by Monsieur Fr. Cavillier in Candollea, **6**, pp. iii–vi (1936). M. L. GREEN.

Old Garden Roses.*—The publication at the present time of this artistically produced book is opportune, as there are indications that an increasing number of gardeners are beginning to take an interest in old-fashioned roses.

The volume is in two sections. The first, dealing with the historical aspect, is a masterly exposition of the subject and one that must have entailed much painstaking research. There are chapters on the rose in Greece, Rome and other countries, and also under Islam, in the Middle Ages and during the Italian Renaissance. In this section there are ten illustrations from famous pictures in which roses are depicted; the colour frontispiece—a Van Huysum—is an exceptionally good reproduction.

In the second half the author describes the chief characteristics of the various groups and of a number of the varieties included in them. Details of their introduction and (where known) the names of the raisers are given. Propagation, planting, pruning and general cultural details are dealt with in an eminently practical manner.

Nineteen beautiful photogravure reproductions of a selection of the old roses are given in this section; also a number of drawings showing a portion of the stem, leaves and buds of several varieties.

The volume is obviously a labour of love and Mr. Bunyard's enthusiasm will certainly stimulate an increased interest in the cultivation of these old favourites.

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